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January 1995
Volume 78, Number 1

BOSTON, MA
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Advances in Pediatrics and Neonatology

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COMMENTARIES

Recent Advances in Pediatrics and Neonatology

The past three decades has seen significant improvement in the infant mortality rate in the US and other developed countries in the world. This is, in part, a result of the explosion of new knowledge and technology that allows us to provide better preventive and therapeutic management of sick infants and children.

The faculty members of the Department of Pediatrics at the Brown University School of Medicine and at Rhode Island and Women and Infants' Hospitals have contributed five articles to this issue to highlight specific areas that have witnessed major advances in the diagnosis and management of specific disorders and contributed to the better outcome of children with these illnesses. New vaccines for various infectious diseases have been developed and tested; an example described in this issue by Penelope Dennehy, MD, is the development of a new vaccine for the prevention of a common childhood illness, varicella. William J. Cashore, MD, describes a new therapy, ie, the use of exogenous surfactant for a very common respiratory illness in preterm infants (respiratory distress syndrome or hyaline membrane disease), which has been proven to be very effective in preventing the disease and markedly improving the survival rate of this group of infants. An example of a common disease that usually has a severe clinical course and often serious outcome is Kawasaki Disease. Lloyd Feit, MD, an expert on this subject, outlines the new therapy, pointing out that the course of this disorder can now be modified, with a better outcome through intravenous immunoglobulin therapy. Lead poisoning is a major public health problem and can produce serious neurologic sequelae in children. We now know much more about its detection, diagnosis and therapy as described by James Linakis, MD. Finally, new technology is being developed to test the hearing ability of newborn infants. Betty Vohr, MD, has attracted national attention with the implementation of a hearing screening program in Rhode Island with the use of a new testing device called evoked otocoustic emission (EOAE). This device and the Rhode Island demonstration program could well become the national model for the universal screening for hearing loss in infants to shorten the time interval for the detection of hearing loss in children with sensory hearing impairment so that intervention to improve hearing can be provided at the critical stage of speech development.

We have come a long way in developing new knowledge and technology through research for the improvement of mortality and morbidity in infants and children. There are still many new frontiers in pediatrics that need to be identified and conquered. It is hoped that, in the midst of our push for health care reform, the importance of fostering research will be recognized to maintain our momentum in acquiring new knowledge for better care for future generations.
William Oh, MD

Music Making

[This letter appeared originally in a recent issue of Psychiatric News *and is reprinted herein with the enthusiastic permission of its author, J. Ronald Bean, MD, a practitioner in San Francisco, California.]*

To the Editor:

This apocryphal material came to my attention and I would like to share it with the membership. The "tune" is certainly familiar!

The president of a large California managed care company was also chairman of the board of his community's symphony orchestra. Finding he could not go to one of the concerts, he gave his tickets to the company's director of health care cost containment. The next morning, he asked the director how he enjoyed the performance. Instead of the expected usual polite remarks, the director handed him a memorandum, which read as follows:

"The undersigned submits the following comments and recommendations relative to the performance of Shubert's Unfinished Symphony by the Civic Orchestra as observed under actual working conditions:

"A. The attendance of the orchestra conductor is unnecessary for public performances. The orchestra has obviously practiced and has the prior authorization from the conductor to play the symphony at a predetermined level of quality. Considerable money could be saved by merely having the conductor critique the orchestra's performance during a retrospective peer review meeting.

"B. For considerable periods, the four oboe players had nothing to do. Their numbers should be reduced and their work spread over the whole orchestra, thus eliminating peaks and valleys of activity.

"C. All 12 violins were playing identical notes with identical motions. This is unnecessary duplication; the staff of this section should be drastically cut with consequent savings. If a larger volume of sound is required, this could be obtained through electronic amplification, which has reached very high levels of reproductive quality.

"D. Much effort was expended playing 16th notes, or semi-quavers. This seems an excessive refinement as most listeners are unable to distinguish such rapid playing. It is recommended that all notes be rounded up to the nearest 8th. If this is done, it would be possible to use trainees and lower grade operators with no loss of quality.

"E. No useful purpose would appear to be served by repeating with horns the same passage that has already been handled by the strings. If all such redundant passages were eliminated, as determined by the utilization review committee, the concert could have been reduced from 2 hours to 20 minutes, with greater savings in salaries and overhead. In fact, if Schubert had attended to these matters on a cost containment basis, he probably would have been able to finish his symphony."

J. Ronald Bean, MD
San Francisco, Calif.

Declining and Falling or About to Be Reborn?

[This essay was written by Robert U. Massey, MD, formerly dean of the University of Connecticut School of Medicine and currently professor emeritus. Dr Massey is also editor of Connecticut Medicine. *This commentary first appeared in the September 1994, issue of* Connecticut Medicine.*]*

> At the close of the Middle Ages, a sombre melancholy weighs on people's souls. Whether we read a chronicle, a poem, a sermon, a legal document even, the same impression of immense sadness is produced by them all. It would sometimes seem as if this period had been particularly unhappy, as if it had left behind only the memory of violence, of covetousness and mortal hatred, as if it had known no other enjoyment but that of intemperance, of pride and of cruelty. J. Huizinga, *The Waning of the Middle Ages*.[1]

This paragraph from Huizinga's scholarly study of 14th and 15th-century France and the Netherlands, written in 1924, has been quoted many times, especially during the past decade, usually by those who have seen in those centuries a "distant mirror" reflecting distorted but recognizable images of our present intemperate and cruel century, so full of overweening pride in its amazing technological and scientific accomplishments.

Thoughtful Europeans 500 years ago—before the rise of nationalism—must have looked back at the promising 12th and 13th centuries and wondered where the wrong turn had been taken. They could hardly have foreseen the Renaissance that was yet to come. But Middle Ages and Renaissance are all artificial, 19th-century terms anyway; they would have meant nothing to the men and women living in times that we have since known by those names. To Huizinga the sadness he perceived in their "life, thought and art" arose from a breaking up of the forms that held their world together.

It is a compelling temptation to read those signs in our contemporary "life, thought and art," although the paradigm of cyclical history seems only partly authentic to most of us. Oswald Spengler had written his *Decline of the West* at about the same time. Like global warming, the decay of a civilization, if it occurs, must be slow and almost imperceptible; unlike global warming, data that record social change cannot be agreed upon and are rarely quantitative.

Yet it seems to me that in the past 6 or 7 years there has been a more general awareness that the times are profoundly out of joint and getting more so. Letters to the editor in the daily paper from ordinary people who seem worried to death at the way things are going, and more sophisticated letters, and even articles, in such publications as the *Atlantic Monthly* or *The American Scholar,* suggest nothing so much as Huizinga's "sombre melancholy." The usually cheerful, always thoughtful and often very funny, editor of *The American Scholar,* Joseph Epstein, shares this mood:

> The pervasive feeling of decline and fall I have been attempting to describe is at bottom about demoralization. In good part, I believe, this demoralization is owing to the loss of belief in progress . . .
>
> Walking the streets of any large American city today one meets with the demented and with the hostile young, lending everything a heavy tone of sadness and menace.[2]

When I was in high school I remember picturing an Italian farmer in the year 476 stopping to rest from his plowing and remarking to no one in particular, "You know, the Western Empire just fell today! The classical age has ended and the Dark Ages have just begun!" And he went on plowing.

For most of us it matters little whether our civilization is still on its Renaissance trajectory, or in a decline and fall, entering the darkness; we will never know for sure for we are only observers traveling through the place. As physicians we are blessed to have a compelling day's work to do, and may recall to our comfort William Osler's philosophy expressed in a misquoted line from Carlyle: "Our main business is not to see what lies dimly at a distance, but to do what lies clearly at hand."[3]

Robert U. Massey, MD

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The Seductive Poppy

In the 17th century, Sydenham states: "Without opium the healing art would cease to exist." In the 19th century, from a different vantage point, a missionary to China declares: "I firmly believe that the devil never invented a vicious habit so plausible and pleasing in its first stages, and so pernicious in its final consequences as this vice of opium smoking." Shakespeare, acknowledging both faces of opium, said: "Within the infant rind of this small flower, Poison hath residence, and medicine power."

Poppy seeds have been identified in the excavations of stone age dwellings. The Sumerians were aware of the properties of opium, calling it the plant of joy. In classical Egypt poppy cultivation was a priesthood monopoly (and a few millennia later, Marx inverted this by contending that religion was the opium of the people). Homer speaks of something called *nepenthes*, the drug of forgetfulness, which may or may not have contained opium. But the Greeks, never at a loss for words, had many terms for this precious substance: *meconin* (poppy-juice) perseveres in such current words as meconic acid and meconium; and the word, *opium*, (diminutive of *opos*, meaning plant sap) has achieved a singular immortality of its own. Both wars and women's perfume have been named after it.

The poppy grows readily in temperate and subtropical climates but is sensitive to drought and frost; it prospers best, therefore, in moist, subtropical conditions. All poppy species are productive of opium, but it is the white poppy that yields the most. The narcotic alkaloids are concentrated principally in the exuding sap of the poppy-head but in smaller concentrations are also found in the stem and leaves. Only the inner seeds of the poppy are free of narcotic agents. Through the ages, however, these poppy seeds—with their flavorful fatty acids—have become ideal culinary additives for such edibles as bagels and Purim pastries (eg, Hamantashen).

Opium sap is easily recovered by making superficial cuts on the surface of the immature poppy-head at sundown and later next morning collecting the inspissated juice. By the 16th century crude opium was widely available as an oral anodyne. In western Europe it was dispensed as a simple tincture called laudanum or a camphorated tincture called paregoric.

The Romans named the opium-yielding plant Papaver (corrupted, then, through various Romance languages to the current English word, poppy; Linnaeus later named the white poppy *Papaver somniferum*). Etymologists claim that the word *papaver* was earlier derived from the Latin, *pabulum* (food) in recognition of the primitive custom of adding the poppy plant to infant food to prevent colic. When poppy plants were boiled in water, the decoction was given the Latin name, *meconium*. Centuries later, clinicians named the fecal discharges of the newborn, meconium, because it resembled the turbid, greenish fluid of boiled poppy sap. The Latin word *papaver* is preserved in the name of the drug, papaverine, an alkaloid fraction of opium juice.

In the 18th century of western Europe, opium was said to be the domain of the sybarite. Many, with or without literary pretensions, relied upon opium to survive the boredom of their lives. DeQuincey wrote of his experiences with the drug (*Confessions of an Opium Eater*) describing the greatly increased "activity of the mind . . . by which we are able to construct out of the raw material of organic sound a chorus of elaborate harmony . . . incarnated in the music." The extravagant sensations, the indelible colors, the extinctions of time and the revival of buried memories led DeQuincey to call opium the key to paradise; but he experienced, as well, uncontrolled cravings, episodes of disorientation and a sense of persecution. "Opium gives—and takes away," he once observed.

Until the late 19th century, laudanum (the curse of Coleridge) could be bought at

modest cost and without a prescription. The medicinal use of opium had now extended far beyond mere pain extinction: it was a blessing in the suppression of the racking cough of pulmonary tuberculosis; it diminished the colics and diarrheas of infancy and the dysenteries of adult life; it permitted the setting of fractures; it eased childbirth; and it calmed battlefield wound victims.

Commercial opium production, in the 19th century, was centered largely in India, Turkey, Persia and Serbia. The principal destination of India's opium was a relatively defenseless China where its forced introduction into the Chinese market place led to a number of one-sided confrontations called the Opium Wars. By the mid-19th century, China had been flooded with opium. For a while opium even surpassed tea as India's major cash crop. By 1890, according to British estimates, about 8% of Indian males and 27% of Chinese males were habitual users of opium. (Opium smoking, in truth, was an inefficient process; only about 1.4% of the active alkaloids survived to reach the lungs.) In London, Parliament perennially debated the ethics of commerce in opium, but it was not until 1906 that it finally declared: "This House affirms its conviction that the Indo-Chinese opium trade is morally indefensible."

In the United States there was a gradual disenchantment with free access to opium, hastened by articles on the dangers of unregulated patent medicines containing opium. There were parallel anxieties following the importation of large numbers of Chinese for the building of the western railroads. The general public, afraid of further competition for scarce laboring jobs and aware of the opium-smoking habits of some Chinese, responded readily to a communal hysteria called "the Yellow Peril." In 1875, the citizens of San Francisco enacted the first laws in the US regulating opium commerce and usage. By 1910, there were international treaties governing the production and movement of opium.

In 1880, addiction to opium and its derivatives among non-Asian Americans was a widespread, but low-grade social problem. Most chronic users had been women (in 1880, 72% of identified opium addicts in the US were women; by 1905, 65%; by 1913, 59%; and by 1970, only 15%). Before 1914, many readily available medications for "women's problems" contained tincture of opium. Female habituation prompted no great journalistic outcries since it tended to be silent, free of criminal taint and without adverse effect on industrial or farm production. Following the Harrison Act, addicts were increasingly found among the medical/nursing professions. Jazz musicians had also discovered the blandishments of opium, and many popular songs of the 1920s contained veiled allusions to opium. The association of opiates with criminality and an international drug industry has been a relatively recent event.

Opium could be smoked ("drows'd with the fume of poppies") or taken orally, but not used parenterally. In 1806 a German chemist, Friedrich Sertumer, separated the elements of opium, recovering a fraction containing meconic acid. From this he extracted a powerful alkaloid that he called *principium somniferum*; later, he named it *morphium* after Morpheus, the Greek god of sleep. Besides being substantially more powerful than opium, the sulfate of this drug, now called morphine, could readily be given subcutaneously. It required, however, the simultaneous discovery of morphine and the invention of the hypodermic syringe to make this parenteral administration possible. A second major opium alkaloid, called codeine, was isolated in 1832. Its name is derived from the Greek, *codeia*, meaning head (ie, poppy-head). In searching for a narcotic compound less addictive than morphine, Dreser in 1898 synthesized a diacetyl derivative of morphine, calling it heroin, after the Greek *Hero*. His claim that it was nonaddictive sadly proved to be false.

The Roman God of sleep, Somnus, is portrayed as a healthy youth, with wings on his forehead and stalks of poppies in his hand as he bestows the gift of slumber upon the deserving. The poppy was chosen as a symbol of merciful sleep particularly by those who mourned World War I victims. "In Flanders fields the poppies blow, Between the crosses row on row." And until recent years, elderly veterans still sold artificial poppies each Memorial Day.

Stanley M. Aronson, MD

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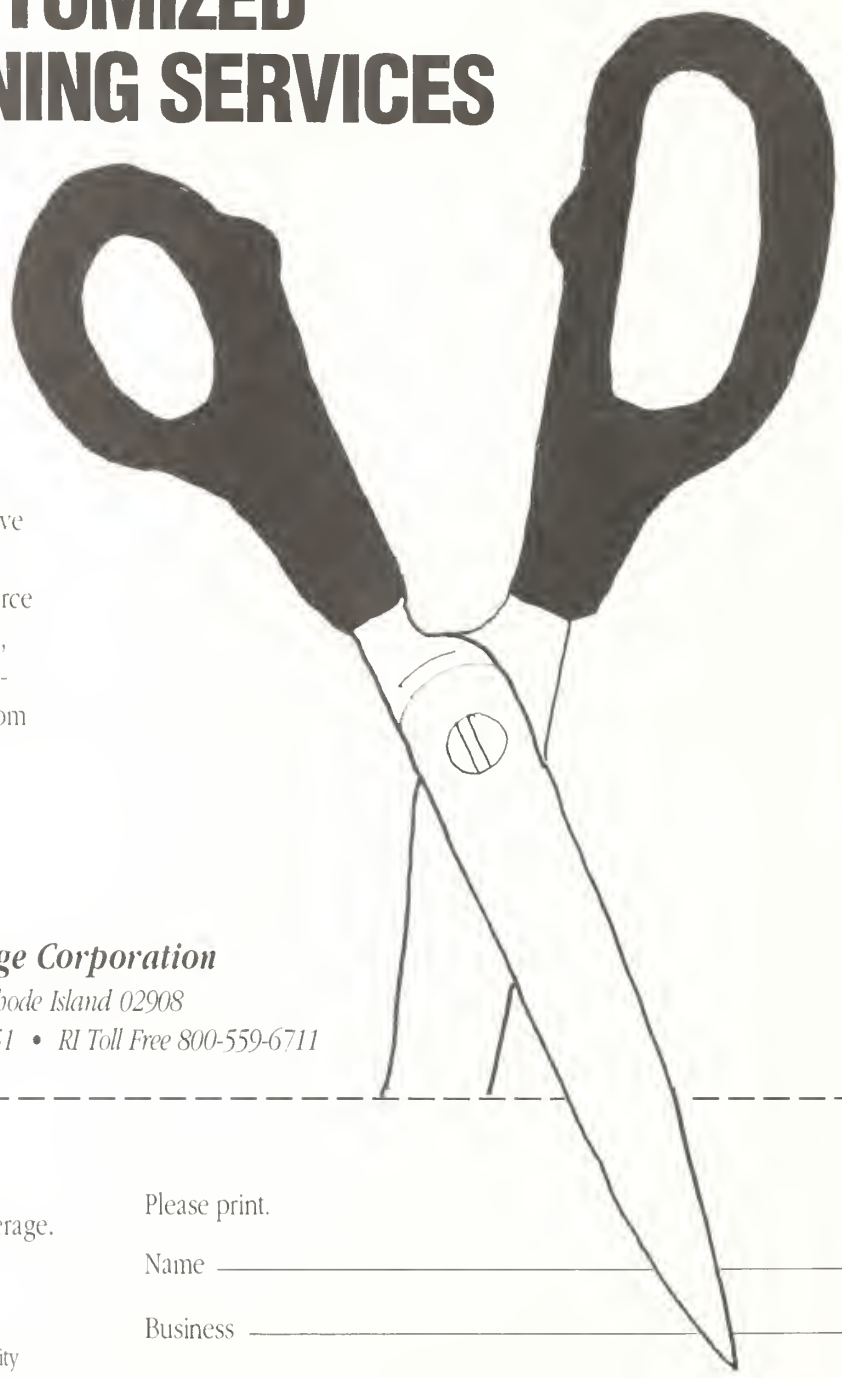

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Exogenous Surfactant In Neonatal Respiratory Distress Syndrome

William J. Cashore, MD

Surfactant replacement in respiratory distress syndrome is now an accepted therapy for treatment of newborns in neonatal intensive care units worldwide, and has been credited with a significant decrease in low birthweight mortality and morbidity.

Respiratory distress syndrome (RDS) of prematurity long has been a leading cause of neonatal death. Although predominantly a disease of preterm, low birthweight infants, RDS sometimes afflicts larger infants (≥2500 grams), closer to term (≥37 weeks), especially if they are born to mothers with poorly controlled diabetes or by elective cesarean section without labor.

The relationship between RDS and immaturity or insufficiency of pulmonary surfactant production was described by Avery and Mead in the 1950s.[1] Antenatal or immediate postnatal testing of amniotic fluid or gastric fluid for the presence of surfactant followed in the 1960s. This testing was an aid to specific diagnosis of the disorder and for monitoring the maturity and adequacy of pulmonary surfactant production before planned deliveries, eg, of large for gestational age infants in maternal diabetes.[2,3] In the 1970s, Liggins et al first described the use of corticosteroids to mature surfactant production in utero before premature delivery.[4] However, antenatal measurement or induction of surfactant was not always feasible, especially under the circumstances of an emergency delivery of a very low birthweight infant before term. Often, the rapid progression of premature labor, premature rupture of membranes, or maternal condition requiring an emergency delivery precluded attempts at antenatal diagnosis or induction of surfactant. Consequently, efforts began in the 1980s to replace surfactant postnatally in high-risk newborns with evidence of progressive RDS.

Early attempts at surfactant replacement involved attempts to aerosolize the surfactant for delivery to the lungs. The surfactant itself consisted of pulmonary phospholipid material extracted either from animal lungs or from human amniotic fluid. The extraction procedures were difficult and tedious, and aerosolization of the complex lipid mixture that composes pulmonary surfactant proved mechanically difficult.

During the later 1980s, further technical refinements in the harvesting, preparation, and packaging of surfactant made it possible to concentrate the surfactant material into small volumes and deliver it by direct instillation into the tracheobronchial tree. Distribution of the surfactant to terminal airways was then achieved by positive pressure ventilation of the instilled surfactant, rather than by attempts at aerosolization. With the evolution of various technical refinements, this approach appeared to be more promising than delivery by aerosolization, and clinical trials of instilled surfactant were carried out successfully and reported during the late 1980s in Japan, Europe, and the United States.[5,6] The random clinical trials of surfactant in the late 1980s were sufficiently successful for designation of two formulations of surfactant as investigational drugs by 1989, and for open licensing of several forms of surfactant for use in premature infants by 1991. Surfactant replacement in RDS is now an accepted therapy for treatment of newborns in neonatal intensive care centers worldwide, and has been credited with a significant decrease in low birthweight mortality and morbidity.[7,8] Exogenous surfactant is, perhaps, the first and for a time had been the only pharmaceutical product designed specifically for treatment of premature infants.

. . . endotracheal intubation and at least a short period of assisted ventilatory support are necessary to initiate and sustain surfactant treatment.

Several forms of exogenous surfactant are now available for neonatal use. Two of the commercially available surfactants are animal products, extracted from bovine and porcine lungs, by processes of concentration, purification, and sterilization. Because of a high degree of homology in all mammalian surfactants, the phospholipid components of bovine and porcine surfactant are identical to those of human surfactant. The low molecular weight proteins that are found in naturally occurring surfactants and appear to function as stabilizers are also present in these preparations, and are also highly homologous with human surfactant proteins. The animal products are purified of other proteins not essential to the physiologic function of the pulmonary surfactant system. Both the bovine and porcine surfactant products are packaged as stable lipid emulsions in sterile vials with a long shelf life at ordinary refrigerator temperatures (4°C), and these products also maintain their sterility for several hours at room temperature.

A third surfactant product consists of phospholipids manufactured by cloning the human genetic pathway for pulmonary surfactant phospholipids. This is a purified preparation of human surfactant phospholipid (principally, dipalmitoyl lecithin), packaged in sterile vials as a lyophilized powder with a long shelf life at room temperature. Liquid surfactant is reconstituted with sterile water just before use. The apparent advantage that the cloned surfactant has of containing no animal material and, presumably, no likelihood of infectious particles from living material, is somewhat offset by the absence of surfactant stabilizing proteins in the currently available genetically cloned product.

All three surfactants are given by direct instillation into an endotracheal tube in the form of a lipid emulsion, at a dose of approximately 4 to 5 ml per kilogram. Indications for surfactant treatment and some specific details of the administration technique will be discussed below.

ABBREVIATIONS USED
BPD: Bronchopulmonary dysplasia
NICU: Neonatal intensive care unit
RDS: Respiratory distress syndrome
WIH: Women and Infants Hospital of Rhode Island

William J. Cashore, MD, is professor of pediatrics, Brown University School of Medicine, and associate chief of pediatrics, Women & Infants Hospital of Rhode Island.

This review will summarize our recent past and current experience with neonatal surfactant treatment at Women & Infants Hospital (WIH), and will place the experience in the context of results obtained from several other centers nationwide. Mortality, morbidity, and a recent report concerning cost effectiveness will be discussed.

Surfactant Treatment at WIH

Following several reports of favorable clinical responses to neonatal surfactant treatment in small trials during the 1980s, WIH and other large neonatal centers joined in clinical trials of bovine surfactant in the late 1980s.[5-8] In 1987 and 1988, our center was one of several participants in a randomized double blind trial of prophylactic surfactant administration in the delivery room for low birthweight infants of 750–1250gm. Sufficient numbers of low birthweight infants were enrolled to make a clear determination of efficacy for early treatment. Simultaneously, other centers were enrolled in a surfactant "rescue" treatment protocol, ie, a treatment strategy in which surfactant was given in the nursery according to predetermined clinical indications, rather than in the delivery room based on birthweight and gestational age. The rescue protocols were also double blind studies designed to enroll sufficient numbers of patients to show efficacy at various birthweights. During the same period, randomized clinical trials of other surfactant products and other administration strategies were being carried out in other centers.

In comparison trials, different formulations of surfactant have shown little or no difference in eventual survival or outcome of low weight infants.

By the end of 1988, enrollment in the WIH arm of the study was complete. During most of 1989, neonatal surfactant was unavailable in Rhode Island and in most other centers, pending further analysis of data and further progress of the licensing procedure by the manufacturers and the Food and Drug Administration. In January 1990, another phase of clinical trials was begun, this time allowing open use of bovine surfactant either at birth or postnatally, according to a strictly defined protocol. During this phase of the trial, the drug was readily available for all patients requiring treatment, provided the approved protocol was followed. By late-1991, final data analysis and licensing arrangements had been completed, and both animal-derived and human-derived surfactant then became generally available for treatment of neonates.

Table 1.—Surfactant Therapy: WIH Experience, 1989-1993

Year	# Admissions	#PTS/#Doses	Deaths <1500gm	%BPD*
1989**	1135	0/0	44/208	25
1992	1382	214/405	33/227	20
1993	1286	197/418	25/189	38

* Supplemental O_2 at age ≥ 28 days.
** Comparison Year—No Surfactant

Current Experience, Indications, And Results

Since the beginning of the open clinical trial in January 1990, surfactant replacement therapy has become part of our standard treatment for RDS of prematurity. The basic indication for treatment is oxygen-dependent respiratory distress in a newborn (generally preterm) infant with a significant oxygen requirement and a clinical and radiologic presentation consistent with the diagnosis of RDS. Practical indications for initial treatment include the following:

1. Inability to maintain arterial pO_2 ≥80mm Hg in 40% oxygen.
2. Early requirement for endotracheal intubation, resuscitation, and oxygen therapy in very low birthweight infants who: a) require ventilatory and oxygen support at or immediately after delivery, and b) have a chest x-ray compatible with RDS.
3. Worsening respiratory distress within the first 12–24 hours in an infant whose clinical and x-ray findings are compatible with respiratory RDS.
4. Retreatment 6-8 hours after an earlier dose is indicated for failure to maintain an arterial pO_2 ≥80mm Hg with an oxygen requirement ≥30%.
5. Some centers have used indices of severity based on ventilatory or oxygenation index (ie, formulas based on the oxygen requirement or ventilatory support needed to maintain a minimal acceptable pO_2); however, indications at WIH have continued to follow the simpler criteria noted above, which were treatment criteria in the original clinical trials at our institution.

Surfactant replacement treatment can be initiated at or shortly after delivery, during

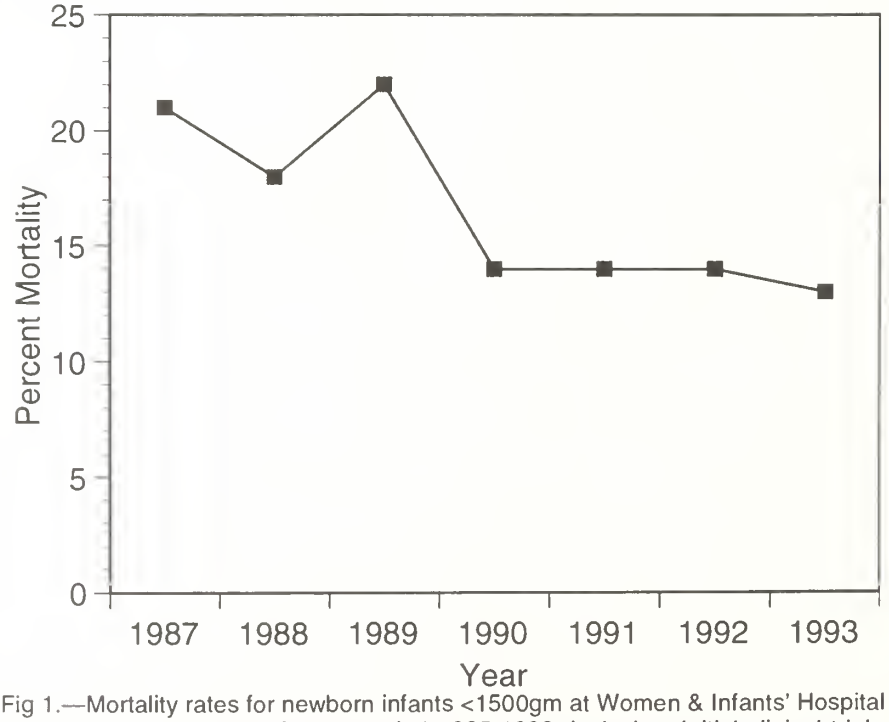

Fig 1.—Mortality rates for newborn infants <1500gm at Women & Infants' Hospital of Rhode Island are shown for the period 1987-1993, inclusive. Initial clinical trials of surfactant were carried out at this institution in 1987 and 1988. During 1989, surfactant was unavailable pending data analysis and licensing requirements. Surfactant was reintroduced in January of 1990, and has continued in use to the present. Using 1989 (no surfactant) as a comparison year for the subsequent years 1990–1993, when surfactant was available, first for open trial and then as a formulary drug, mortality <1500 grams has decreased from 21% to approximately 14%, without other major changes in treatment strategies for infants in this weight category.

preparation for transport from a referring hospital, or at any time during the first 24 hours after admission to a Level III NICU. Accurate placement of an adequately sized endotracheal tube above the carina, and radiologic confirmation of endotracheal tube placement and the pattern of pulmonary disease, are necessary for effective delivery of surfactant to all segments of both lungs. For this and other reasons, following our initial clinical trial of surfactant prophylaxis, we no longer routinely initiate surfactant treatment in the delivery room. In most cases of respiratory distress in very low birthweight infants, we perform a prompt clinical and radiologic evaluation of the baby immediately after admission to the intensive care nursery, and then give the first dose of surfactant as soon as the diagnosis of RDS is confirmed, treatment criteria as noted above are met, and accurate placement of the endotracheal tube is assured. In practice, this means that most distressed infants are treated within 1 to 2 hours after birth, and some immediately after admission to the NICU. Other babies with milder disease are observed for several hours until treatment criteria are met.

Endotracheal intubation and at least a short period of assisted ventilatory support are necessary to initiate and sustain surfactant treatment. This means that most treatments in our region will be performed upon admission to the Special Care Nursery, or occasionally upon arrival of the transport team at a referring hospital. The surfactant is stable during transport, so that the first dose can be given when the transport team arrives and the endotracheal tube is properly placed.

Results

Multiple studies of surfactant treatment[5-8] have shown decreased mortality and morbidity from RDS as evidenced by lower levels of oxygen administration and respirator settings; a decrease in pulmonary interstitial emphysema; and a decrease in the incidence of pneumothorax. In comparison trials, different formulations of surfactant have shown little or no difference in eventual survival or outcome of low birthweight infants. There has been little or no change in the rates of "early" bronchopulmonary dysplasia (BPD) defined as persistent oxygen dependence at 28 days of age, after surfactant treatment. To date, the use of surfactant has likewise had relatively small influence on other prematurity-related complications, although long term follow-up data on other complications of prematurity in the era of surfactant treatment are incomplete. Finally, it is not clear if there is an optimum dose schedule for surfactant administration different from the dose schedules established during the multicenter clinical trials of surfactant that led to its widespread use.

Table 2.—BPD in Patients <1500gm

Year	#BPD/#Pts.*	%	Late Deaths
1989	41/164	25	NR
1992	39/194	20	6
1993	63/164	38	4

*Infants < 1500 grams and surviving at least 28 days.
NR = not recorded.

Following verification of efficacy in the open clinical trial, bovine and human surfactant became formulary drugs at WIH in late 1991. Table 1 compares the number of NICU admissions, patients treated, surfactant doses given, and mortality and BPD morbidity for the calendar years 1992 and 1993, compared with the calendar year 1989, when surfactant was not available in the nursery. In 1992 and again in 1993, about 400 doses of surfactant were given to about 200 patients. Data for surfactant administration in 1990 and 1991 are not comparable to the 1992–93 numbers for patients treated with surfactant, because of limitations imposed by the clinical trial criteria. However, compared to 1989, even with more limited use of surfactant, mortality of infants under 1500gm at WIH was slightly lower in 1988 (the second clinical trial year), than in 1989 when surfactant was not available. Since 1990, when surfactant has been available first for the open clinical trial and later for general use in distressed newborns, neonatal mortality has decreased from 21.1% of all Special Care Nursery admissions under 1500 gm in 1989 to approximately 14% of similar birthweight admissions in the years 1990 through 1993 (Figure 1). This trend is consistent with post-1990 changes in mortality data recently reported by Schwartz et al for a nationwide survey of 14 comparable perinatal centers following the introduction of surfactant treatment in 1990.[8] The effect on other respiratory morbidity in patients <1500gm birthweight has been less dramatic as a result of surfactant treatment. Table 2 compares oxygen dependence at 28 days of age among 1989, 1992, and 1993 for patients <1500gm. So far, the incidence of 28-day oxygen dependence in very low birthweight infants has not been altered by surfactant treatment. The severity of oxygen requirement and need for prolonged assisted ventilation are still being analyzed at this and other centers. However, at this point, definitive conclusions cannot be drawn, especially since the increased survival of newborns 500-750gm within the <1500gm cohort continues to increase the population of extremely low birthweight infants at risk for multiple respiratory and other morbidities.

While comparison studies show little or no difference in eventual outcome from treatment with several types of replacement surfactant, clinical experience here and at other centers supports the impression that early clinical improvement in surfactant deficient patients occurs more rapidly with bovine than with synthetic surfactant. Over time, this difference in the initial response seems to attenuate, so that by 28 days the actual differences in survival and persistent respiratory morbidities are small, and all forms of surfactant seem efficacious for increased survival.

Acute clinical morbidities associated with surfactant administration are infrequent. These include occasional patient intolerance to the delivery of fluid into the lung; left to right shunt through the ductus arteriosus as pulmonary vascular resistance falls with increased lung expansion; rare instances of pulmonary hemorrhage; and rare cases of progressive disease unresponsive to retreatment. Initial concerns about bacteremia, pneumonia, and other infections possibly related to the administration of animal products appear to have been unfounded; the increased survival of very small premature infants probably increases the population of infants at risk for sepsis from multiple causes other than their pulmonary treatments.

Cost-effectiveness

Schwartz et al documented that surfactant treatment has increased low birthweight survival without adding to the cost of care; in fact, their analysis indicated a net savings within the neonatal intensive care network as a result of surfactant treatment.[8] Although a comparable cost analysis is not available for our experience at WIH, comparison of the cost of treating individual patients with the per diem cost of neonatal intensive care promises comparable cost savings for patients in our region. In 1992 and 1993, when about 200 patients were treated annually, the average cost per patient of surfactant treatment was $1365. This figure is less than the per diem cost of either maximal or intermediate neonatal intensive care, and approximates two days of per diem costs for continuing care. Therefore, a reduction of one or more days in the need for maximal or

intermediate neonatal intensive care, or a reduction of the total length of stay including continuing care nursery by 2 or more days, would more than recover the cost of administering the treatment, and would potentially represent a cost saving for the regional intensive care network. Further analysis will be needed to verify that cost savings are actually achieved by surfactant treatment. An additional possibility is that with increased successful use, the cost of the drug may be decreased, making the cost saving of this somewhat expensive but very effective treatment even more evident.

Future Developments

The necessary long-term solution to the need and cost for neonatal intensive care is to reduce the incidence of prematurity and low birthweight, a public health strategy beyond the scope of this review. A more promising intermediate strategy would be the optimization of antenatal steroid treatment for mothers at risk of delivering preterm low birthweight infants. Beyond the steroid-induced maturation of surfactant production in preterm infants, there may be other developmental and physiologic benefits to maternal antenatal steroid administration, a treatment still used in only a minority of cases of preterm delivery in many centers. Finally, the long-term safety and potential morbidities of early surfactant replacement need to be evaluated in suitably designed follow-up studies. Treatment strategies for the amelioration of late or long term oxygen dependence in very low birthweight infants need to be developed and evaluated longitudinally.

Conclusion

The development of a specific treatment for surfactant replacement in very low birthweight infants is one of the first instances in which a drug has been developed specifically for use in the premature infant. Early returns on this treatment strategy appear to be very positive for survival and cost-effectiveness. However, questions of short-term co-morbidities and long-term morbidities related to preterm delivery and prolonged oxygen exposure, even exposure to room air, still remain and require further study.

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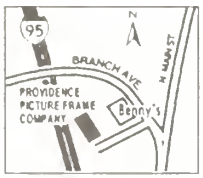

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The Rhode Island Hearing Assessment Program

Betty R. Vohr, MD

The transient evoked otoacoustic emissions method measures sounds emitted by the outer hair cells of the cochlea of healthy ears in response to acoustic (click) stimulation.

Two of every 1000 infants have severe to profound sensorineural hearing loss, and another 3 per 1000 have mild and unilateral loss.[1,2] Early identification of infants with hearing impairments is critical to avoid devastating effects in the development of speech, language, and communication skills.[3] Despite the Healthy People 2000 goal to lower the age of hearing impairment identification to less than 12 months by the year 2000, however, the average age of identification of sensorineural hearing loss in the US is 30 months.[4] Lack of progress in the development of screening programs has been due, in part, to the lack of sensitivity and specificity in screening methods (eg, High Risk Register,[5] Crib-o-gram,[6] Auditory Response Cradle[7]). Other tests were expensive, requiring a professional to administer (eg, Brainstem Auditory Evoked Response[8]).

To develop a cost effective approach to screening, the Joint Committee on Infant Hearing in 1972 recommended identifying infants "at risk" for hearing impairment and evaluating only those infants with at least one of five established risk factors. The American Speech Hearing Association (ASHA) subsequently increased the number of risk factors to seven in 1982 and to 10 in 1990.[10] Using risk factors to identify at risk infants results in reducing the number of infants referred for audiological evaluation. Mauk et al,[11] however, reported that about half of children with sensorineural hearing impairment do not have a risk factor and will be missed by programs screening only those infants with risk factors.

This paper will provide a history of the development of hearing loss screening in Rhode Island and provide an overview of the new screening program being used, Transient Evoked Otoacoustic Emissions (TEOAE).[12]

Background

The first law requiring testing for hearing impairments in infants in Rhode Island was passed in 1979. Although the law stipulated that every high risk infant be screened by procedures approved by the health department, no procedures were recommended and no funds were allocated for the screening. In response to the legislation, Women and Infants Hospital initiated a risk factor program in which the discharge planning nurse for the Neonatal Intensive Care Unit identified infants with risk factors and sent a letter at the time of hospital discharge to family physicians providing information about the infants' high risk status. This process later was expanded to include a letter to the parents and to the Rhode Island Hearing and Speech Center.

Compliance for follow-up testing was low, however, so to facilitate the screening process, Women and Infant Hospital began screening infants with the Brainstem Auditory Evoked Response (BAER) method in 1988. This is a reliable hearing screen/test method that measures the neurotransmission of sound in the peripheral auditory nerve and brainstem. BAER, however, is relatively time-consuming (30 to 40 minutes per infant), requires extensive training for administration, involves the placement of electrodes on the scalp, and is expensive.

In 1989 the US Departments of Education and Maternal and Child Health conducted a search for states to carry out demonstration projects for universal newborn hearing screening. Because of the size of the state and the ongoing successful screening with BAER at the Women and Infant Hospital NICU, the state of Rhode island was chosen with Women & Infants Hospital as the site.

To help identify an ideal method for the demonstration project, project investigators attended the fall 1989 meeting of ASHA where Dr David Kemp, a University of London physicist, presented a method he had discovered for testing cochlear function. This TEOAE method measures sounds emitted by the outer hair cells of the cochlea of healthy ears in response to acoustic (click) stimulation.[13] This method requires that a small probe be placed in the ear canal and a seal obtained. A click stimulus is administered, and the emissions, elicited by the outer hair cells of the healthy cochlea, are recorded. The method is unique in that it is frequency but not threshold specific. Absence of emissions indicates a hearing loss >20dB. Since the response is not threshold specific, the loss could be any level between 20dB and 90dB. Figure 1 shows a sample result of a pass, a partial emission, and a fail. The cochlear response can be viewed in both a time domain and frequency domain. In the time domain, a waveform is observed between 0ms and 12ms in the area of the printout marked Response waveform. It is viewed as a spectral transformation in the frequency domain between 0 and 6 kHz. This is best viewed in the printout in the column marked SNR. The clear area is the intensity of the cochlear emission, and the dark area below it represents background noise. The Stim box depicts the stimulus. A pass has an emission present between 1 and 2 kHz, 2 and 3 kHz, and 3 and 4 kHz. A partial emission has an emission present in at least one frequency band, but not all three bands. The most common cause of partial emission is fluid or debris in the ear canal, or middle ear fluid. A fail has no emission present in any frequency band. This finding may be present with canal blockage, middle ear fluid or a sensorineural hearing loss.

Between 1988 and 1991 five studies[12-18] were published reporting that the TEOAE test was an effective screen for hearing impairment in newborns. Bonfils' study reported that TEOAEs were always present when ABR wave 5 threshold was ≤30dB. Stevens[15-16] reported that TEOAE completed in 723 NICU infants has a sensitivity of 93% and a specificity of 84% when compared to BAER at 3 months of age. Stevens

ABBREVIATIONS USED

ABR: Auditory brainstem response
ASHA: American Speech Hearing Association
BAER: Brainstem auditory evoked response
BOA: Behavioral observation audiometry
dB: Decibel
kHz: KiloHerz
NICU: Neonatal intensive care unit
NIH: National Institutes of Health
RIGL: Rhode Island General Law
RIHAP: Rhode Island Hearing Assessment Program
SNR: Signal-to-noise ratio
TEOAE: Transient evoked otoacoustic emissions

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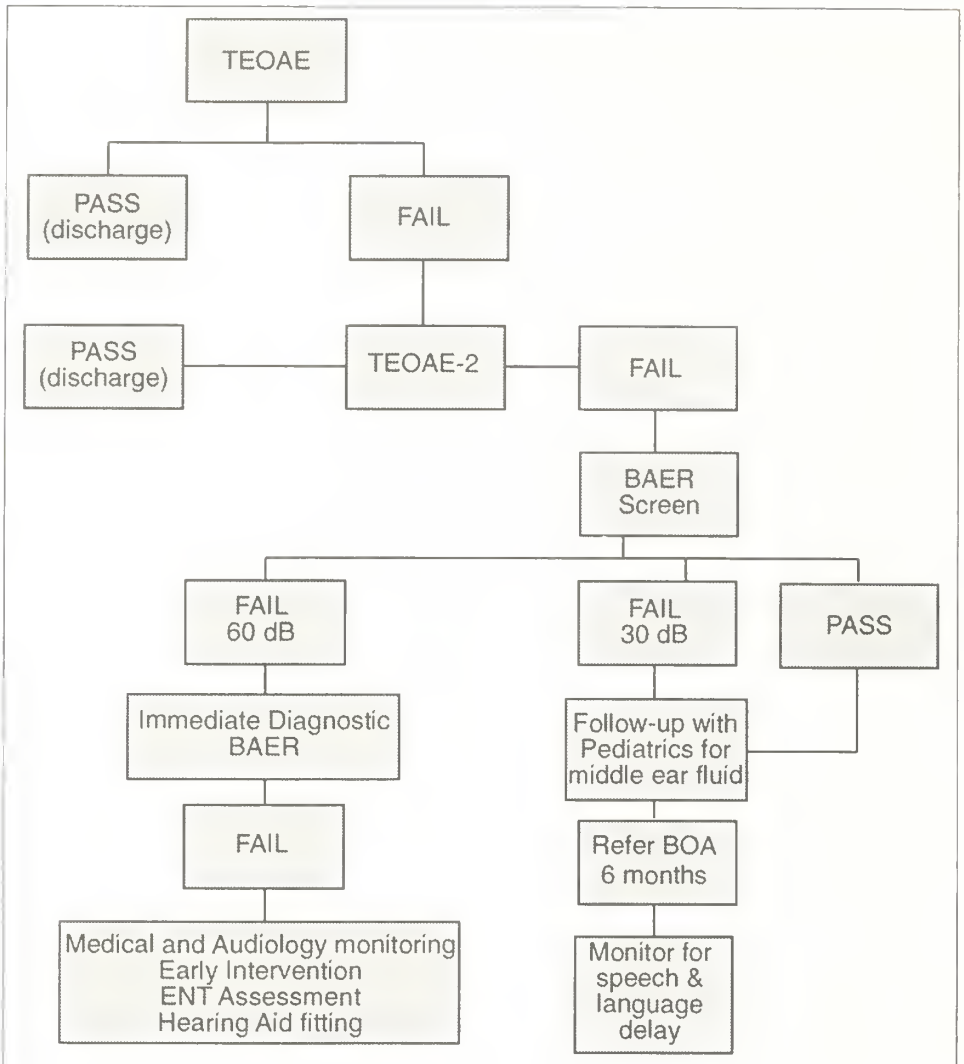

Fig. 1—Screening and intervention protocol for RIHAP.

concluded that since TEOAE is faster than BAER, but yields very similar results, it should be considered a primary screening tool for neonatal hearing screening.

The RIHAP research demonstration project collected data between Aug. 15, 1990, and Dec. 22, 1991, on 3303 infants screened with TEOAE at Women and Infants Hospital. Eighteen infants were identified during that time period with unilateral or bilateral sensorineural hearing loss, indicating a prevalence rate of 5.4 per 1000.[19] Hearing loss was confirmed in follow-up with Brainstem Auditory Evoked Response and Behavioral Audiometry. No infants were identified subsequently with sensorineural hearing loss who passed the screen, resulting in a 2-stage sensitivity of 100% and specificity of 99%. Results of RIHAP were presented at a 1993 National Institutes of Health Consensus conference[20] on early identification of hearing impairment in infants and young children. This panel subsequently issued a consensus statement that recommended universal screening for all US infants within the first 3 months of birth. States are now either screening infants or are in the process of developing or expanding an existing program. As a result of the RIHAP research project on TEOAE testing from 1990 to 1993 and the NIH Consensus statement, which were reported in the February issue of *Seminars in Hearing*,[2] the Rhode Island law was amended, effective July 1, 1993 mandating "that every newborn infant in Rhode Island be evaluated for the detection of hearing impairments in order to prevent many of the consequences." The amended law stipulates that a reasonable fee structure be developed to cover program costs, and that the testing be a covered benefit reimbursable by all health insurers. This second component was critically important since guaranteed coverage facilitates the screening of all infants. Current charges for this method range from $30 to $40 per infant.

Results of the Rhode Island screen program in Rhode Island's eight maternity hospitals since the July 1 mandate will be presented. The hospitals include Women and Infants Hospital, which is the coordination site of RIHAP, Kent County Hospital (Level II), and 6 community hospitals (Pawtucket Memorial, South County, Landmark, Newport, St Josephs/Fatima, and Westerly). RIHAP is administered by a pediatrician, a program coordinator, and an audiologist located at the tertiary care center. An extensive inservice and training program, as part of the preparation for statewide screening, was carried out at the seven hospitals between April 1993 and December 1994. Table 1 is a time-table depicting the start dates for universal screening in Rhode Island hospitals and the number of infants screened between July 1, 1993 and June 30, 1994. Hospitals that started the protocol in the latter half of the training period have screened fewer infants to date. Effective January 1, 1994, all hospitals in Rhode Island were providing universal screening, with fewer than 1% of infants missing their screen because of transfer or early discharge.

Screening is carried out at the hospitals by either RNs, LPNs, audiologists, or paraprofessionals. Screening is completed just before discharge. Normal nursery infants are screened between 8 and 72 hours of birth, and NICU infants are screened 1 to 3 days before discharge. TEOAE screening takes about 9 minutes per infant (1993 data on normal nursery infants). The current protocol in Rhode Island, shown in Figure 2, includes a Stage 1 TEOAE screen before hospital discharge. If the infant does not pass the TEOAE, it is repeated 4 to 6 weeks after discharge. If the infant does not pass the Stage 2 TEOAE, screening BAER is done. Infants who do not pass the BAER at 60 dB are referred for evaluation of middle ear status and an immediate diagnostic BAER to be completed by an audiologist. All other infants who do not pass the Stage 2 TEOAE or the screening BAER are re-

Table 1.—Infants Screened in Rhode Island Hospitals, July 1, 1993–June 30, 1994

Hospital	Start Date	Screened
Women & Infants	July 1, 1993	9,176
Kent County	July 1, 1993	1301
Memorial	August 15, 1993	740
St. Joseph's/Fatima	August 30, 1993	511
South County	September 27, 1993	429
Landmark	October 25, 1993	455
Newport	December 1, 1993	432
Westerly	January 1, 1994	263
Total		**13,307**

ferred for follow-up evaluation of middle ear status and Behavioral Observation Audiometry at 6-8 months of age.

Screen Results

Preliminary statistics for the first year of the state hearing screen program (July 1, 1993 to June 30, 1994) indicate a Stage 1 fail rate of 1,165 of 13,307 (9%). One thousand infants (86%) returned for a Stage 2 screen with a Stage 2 fail rate of 118 of 1,000 (12%). Of the 13,307 infants screened during the time period, 29 (0.2%) were referred for diagnostic BAER, and 291 (2.1%) were referred for BOA. The RIHAP screen program and its referral process to audiologists have been successful in offering families of infants with sensorineural hearing impairment an early diagnosis, and appropriate rehabilitation and education services. Preliminary data from both statewide early intervention and the Parent-Infant Program at the Rhode Island School the Deaf reveals that infants identified with sensorineural hearing loss are receiving services during the first year of life. Additional significant developments have been the organization of an AG Bell sponsored parent group available to all parents whose offspring have hearing impairments, and the development of an Audiology Network. This is an organized group of Rhode Island audiologists with experience and facilities for evaluating infants. A list of' these audiologists is made available to pediatricians and families at risk.

Rhode Island has in place a modern, practical hearing screen program, which is sensitive and detects both conductive and sensorineural hearing loss in newborns. Rhode Islanders can be proud that cost-effective hearing screening is provided to all of its newborns.

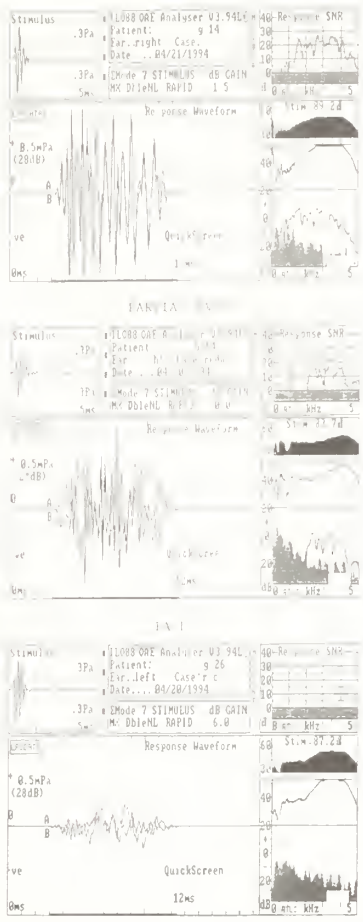

Fig. 2.-Examples of TEOAE pass, partial emission, and fail.

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Varicella Vaccine for Prevention of Chickenpox

Penelope H. Dennehy, MD

Varicella vaccine has afforded 72% protection from any disease and greater than 95% protection from severe disease in household contacts.

Chickenpox, or varicella, is a common infection of children, with 3 to 4 million cases in the United States each year. Until recently, physicians had little to offer normal children with chickenpox other than supportive measures such as antipyretics and antipruritics. In 1992 the US Food and Drug Administration (FDA) approved acyclovir, an antiviral agent for oral treatment of chickenpox in normal children, but use of this drug remains controversial. Approval by the FDA of a live attenuated varicella vaccine is anticipated in early 1995. The rationale for development, side effects, cost, and proposed recommendations for use of varicella vaccine will be reviewed.

Chickenpox in Normal Children

Chickenpox is caused by the varicella-zoster virus, a member of the herpes group of viruses. Chickenpox is the primary infection and usually results in lifelong immunity. After a case of chickenpox the varicella-zoster virus remains dormant in sensory nerve ganglia. Herpes zoster (shingles) represents reactivation of the varicella-zoster virus from latency. Zoster is a painful vesicular rash usually limited to one or two sensory dermatomes.

Chickenpox may occur at any age but is most common in children under age 10. As can be seen in Figure 1, 90% of the population has had chickenpox by age 15. In the US varicella occurs most frequently in the late winter and early spring.

Varicella is highly contagious. The incubation period lasts from 10 to 21 days with most cases occurring 12 to 17 days after exposure. The contagious period begins 1 to 2 days before lesions appear and lasts until all lesions are crusted. The infection is characterized by fever between 38° and 39°C, mild constitutional symptoms such as anorexia, malaise and lethargy, pruritus and rash. Some children have a prodrome of coryza and malaise 24 to 48 hours before the rash appears. Exposed persons who have already had varicella very rarely develop second cases of chickenpox. Varicella is more likely to occur a second time when the first episode is subclinical, develops in a young infant or is very mild. Second attacks of chickenpox are usually mild and are not associated with complications.

The characteristic rash consists of papules that evolve quickly into vesicles, The vesicles that contain clear fluid progress to pustules containing cloudy fluid, These pustules then burst, dry and crust. New lesions appear over a 3 to 5-day period in the normal child. In most children all lesions are crusted by the 7th to 10th day of illness. The rash usually starts on the scalp and spreads to involve the skin elsewhere on the body and may also involve the mucus membranes of the mouth, throat and vagina. The total number of lesions is usually between 200 and 400.

Complications of Chickenpox

Chickenpox is a benign self-limited illness in most children. Although complications in normal children are rare, because large numbers of children acquire chickenpox each year, more than 7000 normal children are hospitalized each year with complications of varicella.[1-4] Figure 2 summarizes the rate of hospitalization for complications of varicella in children and adults. The most common complication is a bacterial infection of the skin that occurs in 1% to 4% of cases. Cerebellar ataxia, encephalitis and pneumonia are much less common affecting 1 per 4,000, 1 per 40,000, and 1 per 200,000 cases, respectively. Reye syndrome, a serious complication characterized by encephalopathy and hepatic failure associated with the use of salicylates, previously complicated 3 to 4 per 100,000 cases but has declined markedly with the use of nonsalicylate containing antipyretics in children. About 50 to 100 deaths from chickenpox occur yearly in normal children in the US, a mortality rate of 1 per 50,000 cases. As detailed in Figure 3 children below 1 year of age and adults have the highest mortality rates.

Children at Risk for More Severe Varicella

In the natural course of varicella, the first case in a household averages 200 to 250 pox while a child who develops varicella after exposure to a sibling with chickenpox will have a larger number of lesions, usually averaging 300-500 pox. In secondary family cases lesions last longer but these children do not have increased amounts of fever or an increased complication rate.

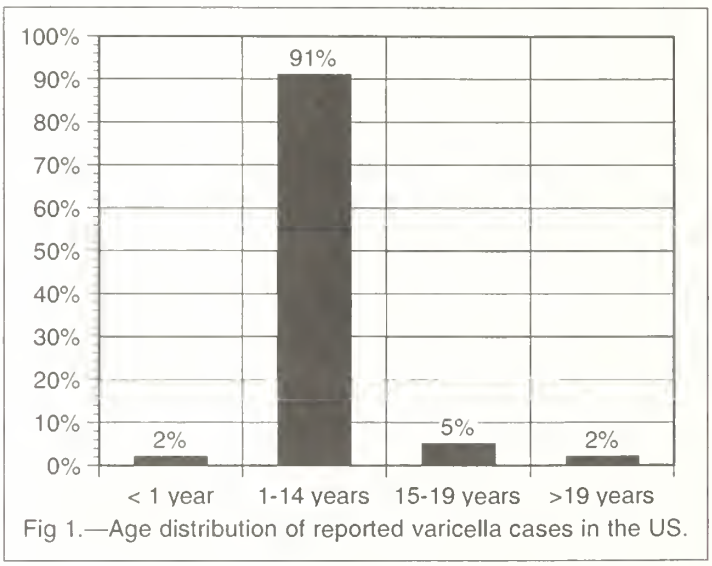

Fig 1.—Age distribution of reported varicella cases in the US.

Approximately 10% of all varicella cases occur in those over the age of 14. Adolescents may be at higher risk for complications requiring hospitalization and are sicker than younger children with varicella. Adolescents have greater numbers of lesions, a more prolonged course, more constitutional symptoms and are more apt to have residual lesions after 1 month than children younger than age 12. Other children at risk for more severe chickenpox

ABBREVIATIONS USED
ACIP: Advisory committee on immunization practices
AIDS: Acquired immune deficiency syndrome
FDA: Food & Drug Administration
MMR: Measles, mumps, rubella (vaccine)

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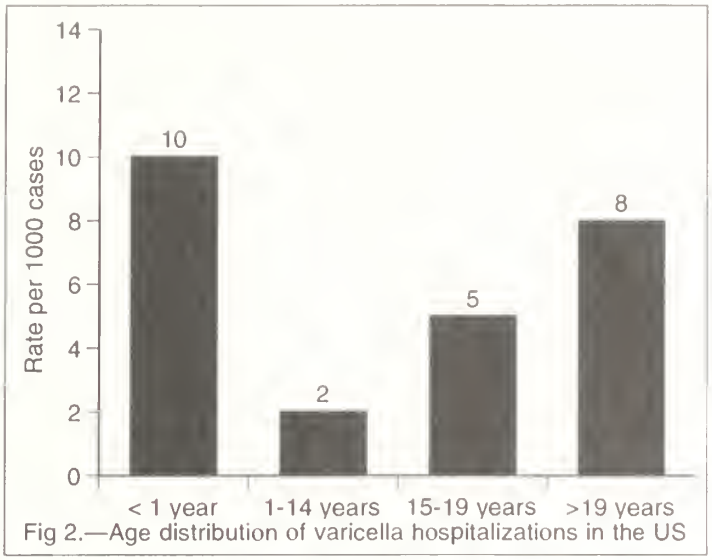

Fig 2.—Age distribution of varicella hospitalizations in the US

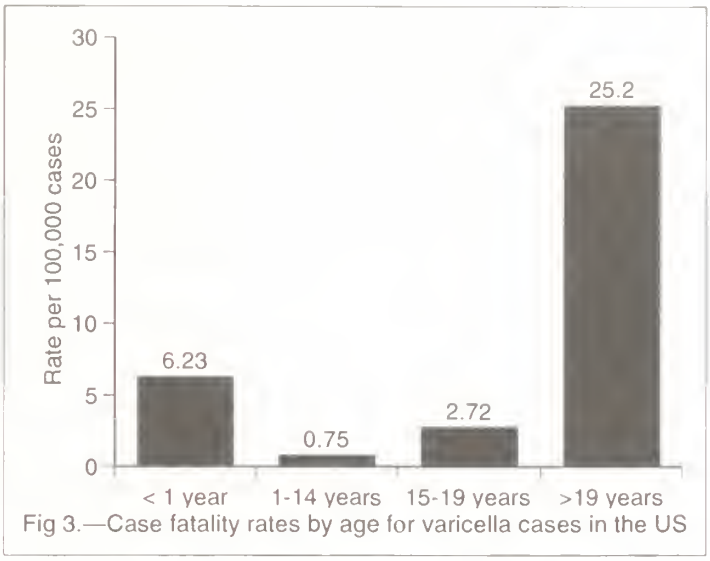

Fig 3.—Case fatality rates by age for varicella cases in the US

include premature infants, newborns whose mothers acquire chickenpox in the peripartum period, children in the first year of life, children with congenital immunodeficiencies, and children whose immune systems are compromised by immunosuppressive cancer chemotherapy, organ transplants, AIDS or corticosteroids. Children receiving chronic salicylate therapy are at risk for developing Reye syndrome as a complication of chickenpox.

Varicella Vaccine

Varicella vaccine was first developed in Japan in 1974.5 The vaccine is a live attenuated preparation of the Oka strain of varicella virus. The Oka strain was originally isolated from the vesicular fluid of a healthy Japanese boy with natural varicella and has been attenuated through sequential propagation in animal and human cell lines. Varicella vaccine for use in high risk children was first licensed in 1984 in several European countries, in Japan in 1986 and in Korea in 1988. In Japan and Korea the use of vaccine was extended to healthy children in 1989 and more than 2 million doses have been administered in those countries. Licensure for healthy children is under consideration in some countries in Europe and an application has been submitted to the Food and Drug Administration for licensure in the United States. Approval for the use of varicella vaccine in this country is expected in early 1995.

Studies of Varicella Vaccine

Clinical trials of varicella vaccine in the United States began in 1981. To date 9,545 healthy children and 1,648 healthy adolescents and adults have received varicella vaccine.[6-10] A summary of the performance of varicella vaccine in clinical trials in healthy children and adolescents and adults is given in Table 1. Seroconversion rates are high after one dose in children and after two doses in adolescents and adults. Adverse events consist primarily of pain and redness at the injection site. A vesicular rash at the injection site or a few scattered vesicles or papules usually numbering less than 10 occurs in 5% of children and 10% of adults. Spread of the vaccine virus from healthy vaccinees to other persons has not been reported.

Varicella vaccine has afforded 72% protection from any disease and greater than 95% protection from severe disease in household contacts.[8] Vaccines have been followed for up to 12 years with protective antibody persisting in greater than 90% of children after 4 years and 97% of adults after 1 year of follow-up.11-13

In clinical trials in the US about 5% of immunized children have developed mild chickenpox over the 8 years of observation.14-16 Most of these children remained afebrile and had fewer than 50 nonvesicular skin lesions. Of the 800 children with breakthrough varicella, none have developed serious complications such as pneumonia. The frequency and severity of breakthrough cases has not increased in the time since immunization suggesting that protection does not wane over time and that booster doses will not to be needed.

Vaccination with varicella vaccine has been associated with a reduced rate of zoster in normal and immunocompromised children. In a population-based study of healthy children with prior history of chickenpox the rate of zoster was estimated at 77 per 100,000 person years.17 Rates in vaccinated children are estimated to be 18 per 100,000 person years. Only one case of zoster has been reported in an adult vaccinee.[18] All cases of zoster were mild and without complications.

The Economic Benefit of Varicella Vaccine

A cost-benefit analysis conducted in 1985 found that 78% of cases would be prevented if vaccine was given at 15 months of age resulting in a 65% reduction in health care costs.[4] At an estimated cost of $35 for varicella vaccine, routine vaccination would save $7 for every dollar spent for vaccination. Most of the savings would come from home care costs as indicated in Figure 4, including the cost of supplying sick care for the average of 8.7 days a child misses from school because of chickenpox.19

Two further cost benefit analyses pub-

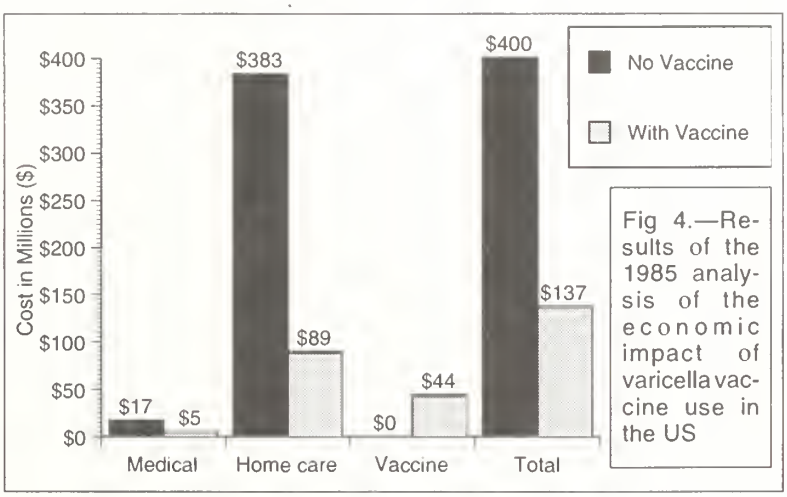

Fig 4.—Results of the 1985 analysis of the economic impact of varicella vaccine use in the US

Table 1.—Summary of the Performance of Varicella Vaccine in Clinical Trials in the United States 1981-1992

	Seroconversion Rate First Dose	Seroconversion Rate Second Dose	Percent with Rash	Rate of Protection
Normal children	97%	N/D	5%	95%
Adolescents & Adults	82%	94%	10%	70%

lished in 1994 found similar benefits with the use of single dose of varicella vaccine at age 15 months. The cost-benefit analysis conducted by the Centers for Disease Control found that 94% of cases of chickenpox would be prevented.[20] At an estimated cost of $35 for varicella vaccine, routine vaccination would save $5 for every dollar spent for vaccination. The cost-benefit analysis conducted at Tufts University found that at an estimated cost of $35 for varicella vaccine, routine vaccination would yield net economic benefits of $66.47 per vaccinee.[21] Most of the economic benefits would come from home care costs, including the cost of the average of 3.7 days a parent misses from work associated with childhood varicella.

Proposed Recommendations for the Use of Varicella Vaccine

Vaccine Dose and Administration

Varicella vaccine is given subcutaneously in the outer part of the upper arm or the anterolateral thigh. Children 12 months to 12 years of age should receive one 0.5 ml dose while persons over 13 years of age will need two 0.5 ml doses separated by 4 to 8 weeks. Varicella vaccine must be stored at -15°C (+8°F) or colder. The vaccine is labile and will need to be reconstituted and used within 30 minutes of reconstitution.

Proposed Immunization Schedule for children

The Immunization Practices Advisory Committee (ACIP) of the Centers for Disease Control and Prevention will recommend routine vaccination with varicella vaccine for all children at 12 to 18 months of age. A history of chickenpox will not be a contraindication to immunization, but a child with physician-documented chickenpox need not receive vaccine. Varicella vaccine will preferably be given at same visit with MMR. A combined MMR-varicella vaccine is currently under development.[22-24] This vaccine would simplify the vaccine schedule and provide a second dose to immunize the small percentage of children who fail the initial immunization. Release of the combination vaccine is anticipated in the next few years.

Catch-up immunization for children from 18 months to 12 years who have not previously had chickenpox can occur at a convenient physician visit such as school entry and should occur before age 13. Children with a history of chickenpox can be assumed to be immune.

Children on steroids may be immunized if they have no underlying immunosuppressive condition and are receiving less than 1 mg/kg/day of prednisone or its equivalent. Those children receiving higher doses of steroids should not be vaccinated for at least 1 month after stopping steroids. Varicella vaccine will not be licensed for use in children with malignancies however vaccine will be available for children with acute lymphocytic leukemia through a research protocol.

Proposed Varicella Vaccine Use in Adolescents and Adults

Varicella vaccine will be approved for adolescents and adults. The vaccine should be given to those with no prior history of chickenpox. Two doses are necessary. Target groups for immunization include susceptible health care workers, family contacts of immunocompromised individuals, day care workers and nonpregnant women of childbearing age.

Summary

Release of varicella vaccine is anticipated in early 1995. The vaccine has proved to be safe and effective in clinical trials over the past 12 years. Proposed recommendations for use include a single dose for routine vaccination of 12 to 18-month-old infants and for catch-up immunization of children from 18 months to 12 years of age and a two dose schedule to immunize susceptible adolescents and adults.

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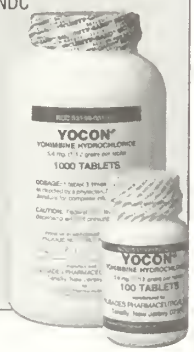

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Kawasaki Syndrome: Diagnosis and Management

Lloyd R. Feit, MD

Any patient with a prolonged febrile illness and late desquamation of the hands and/or feet should be evaluated for the presence of cardiac involvement indicative of Kawasaki syndrome.

Kawasaki Syndrome (KS) (mucocutaneous lymph node syndrome) is an acute multisystem inflammatory disease primarily affecting infants and young children. The prominent clinical features are those of a systemic vasculitis affecting the small and medium-sized arteries. It was first described by Dr Tomisaku Kawasaki in 1967[1] and was first recognized in the United States by Melish et al in 1976.[2] Although most prevalent among those of Oriental ancestry, it has been seen in all races and virtually all geographic areas of the globe.[3] Despite wide ranging advances in its clinical description, pathogenesis, diagnostic criteria and therapy in the past 27 years, the cause of KS remains unknown. This report will review the current practice for KS diagnosis and management and describe recent developments regarding its pathogenesis.

Epidemiology & Etiology

The incidence is highest among children of Oriental ancestry and lowest among Caucasians, with black children experiencing an intermediate incidence within the continental US.[4,5] Passive surveillance in most countries prevents accurate estimation of the prevalence of the syndrome, but Japanese ministries of health have carried out a series of intense epidemiologic surveys that have helped define many characteristics. Epidemics have been reported in Japan in 1979, 1982 and 1986. There is a seasonal preponderance from December to May with a male-female case ratio of approximately 1.5:1. Nearly 85% of cases occur in children under 5 and are rarely seen in those over 7 to 10 years. The peak incidence lies in the 1 to 2-year-old group. Recurrence rates have been reported as high as 1% to 2% in some series, but this observation has not been consistent. Occurrence in siblings may be as high as 2%, though unrelated secondary cases have only been rarely documented, with no known outbreaks in day care settings. Mortality rates in Japanese surveys have been 0.4%;[6] mortality is highest in males less than 18 months of age. Coronary artery involvement has been seen in 15% to 20% of Japanese patients.

US incidence appears to be lower (0.6 cases per 100,000 children under 5 years of age), though no nationwide data are available. The incidence in Hawaii has been better studied, and is closer (range of 21-100 cases per 100,000 children under 5 years of age) to that reported in Japan.[7] There have been reports of regional outbreaks,[8] and the incidence of coronary involvement in the US is similar to that seen in Japan at approximately 15% to 20%.

Characteristics such as seasonal preponderance, clinical presentation and description of epidemic outbreaks suggest an infectious etiology. Rickettsiae, viruses (Epstein-Barr virus, retroviruses), bacteria (group A streptococci, staphylococcus aureus, Propionibacteria), and fungi (Candida species) have all been suggested as etiologic agents. The paucity of non-related secondary cases, lack of documentation of transmission in day care centers and a slightly higher incidence among siblings suggest that familial similarities in immune response play a significant role in pathogenesis. What may be the uniting feature, is an abnormally hyperactive immune response to any of a number of antigenic challenges.[9] Most recently, Leung et al[10] found 81% of 16 patients to be infected or colonized with toxin-producing bacteria. They postulate that these toxins act as super-antigens, inciting an hyperresponsive immune system. The etiologic agent or agents remain unknown.

Diagnosis

The diagnosis of KS rests on the presence of a selected number of clinical criteria listed in Table 1.[11] Fever (generally prolonged) and four of the five principal clinical features should be present to establish the diagnosis of KS. Atypical cases may be diagnosed in those patients with fever and fewer than four principal features if coronary artery findings have been documented by two dimensional echocardiography or coronary angiography.

Fever is generally high (>38.5°C) and spiking in nature. It may last as long as 4 weeks if untreated but usually resolves quickly after initiation of appropriate therapy. Extremity changes are characteristic; palmar or solar erythema along with indurative edema and swelling of the hands and feet. This may be painful at times, and may mimic small joint arthritis. Late changes in the extremities consist of typical periungual desquamation of the fingers or toes, that may progress to involve the palms and soles. This desquamation typically becomes manifest 1 to 3 weeks after the onset of fever. A generalized polymorphous exanthem appears 5 to 7 days into the illness, and may take various forms, though is most often described as a maculopapular morbilliform eruption. It usually involves the trunk and extremities but significant perineal accentuation may cause confusion with diaper dermatitis. The conjunctivitis of KS is typically bilateral, painless and without exudate. Anterior uveitis may also be seen by slit-lamp examination.

Changes of the mouth include strawberry tongue, erythema of the oral mucosa and dry, cracked markedly erythematous lips. Cervical lymphadenopathy is the least common of the principal findings, occurring in 70% to 75% of patients. Adenopathy is generally unilateral with at least one node greater than 1.5 cm in diameter. Erythema of the overlying skin may cause confusion with cervical lymphadenitis, but the nodes of KS are rarely indurated or fluctuant.

Difficulties abound in establishing the diagnosis of KS, especially since principal features often develop sequentially and over a variable time course. Atypical cases (fewer than 5 criteria present) require a strong index of suspicion that would lead the physician to order an echocardiogram, looking for the characteristic coronary artery abnormalities. The differential diagnosis of KS includes a wide range of disorders (Table 2). Perhaps the most important to rule out is measles, so that important infection control measures may be instituted quickly. Any patient with a prolonged febrile illness and late desquamation of the hands or feet should be evaluated for the presence of cardiac involvement indicative of KS.

Associated Findings: A wide array of associated findings that occur with variable

ABBREVIATIONS USED
ESR: Erythrocyte sedimentation rate
IVGG: Intravenous gamma-globulin
KS: Kawasaki syndrome
QID: Quater in die

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Table 1.—Clinical and Laboratory Features of Kawasaki Disease

Diagnostic criteria (principal clinical findings*)
Fever of at least 5 days' duration
Presence of four of the following principal features:
Changes in extremities
Polymorphous exanthem
Bilateral conjunctival injection
Changes in the lips and oral cavity
Cervical lymphadenopathy
Exclusion of other diseases with similar findings (Table 2)

* Patients with fever and fewer than four principal clinical features can be diagnosed as having Kawasaki disease when coronary artery disease is detected by two-dimensional echocardiography or coronary angiography.

frequency are listed in Table 3. Those more commonly seen are: intense irritability (especially among infants), arthritis, and arthralgia, which is often polyarticular involving the knees, ankles and hands. Nonspecific gastrointestinal symptoms including vomiting, diarrhea and diffuse abdominal pain that may relate to hydrops of the gall bladder, also are seen commonly.

Laboratory Findings: There is no diagnostic laboratory test for KS. Early in the course, one commonly sees leukocytosis with a left shift, mild anemia (normochromic/normocytic), sterile pyuria, and elevated acute phase reactants, particularly, the erythrocyte sedimentation rate (ESR). If a spinal tap is performed (often because of extreme irritability) mononuclear pleocytosis may be observed. Thrombocytosis, which may exceed 1 million per deciliter, occurs about 7 days into the illness.

Cardiac Findings: Cardiovascular deficits are the most common cause of both short and long term morbidity and mortality in patients with KS. During the acute, inflammatory phase of the illness, generalized myocarditis is common, and some investigators suggest it may be present in all patients to some degree. Clinically recognizable signs of myocardial inflammation include tachycardia out of proportion to the degree of fever, persistent gallop rhythm, or actual signs of congestive heart failure. The electrocardiogram may demonstrate nonspecific abnormalities such as PR prolongation, flattening of the T waves; or more specific signs of ischemia due to coronary insufficiency, such as ST segment elevation or significant ventricular ectopy. Pericardial effusion is seen in 25% to 30% of patients with KS. It is generally self-limited and resolves with anti-inflammatory measures but may rarely progress to cardiac tamponade. Mitral regurgitation usually of a mild degree, is present in 1% of patients.

The hallmark of KS is coronary artery dilation on echocardiography in 20% of patients if left untreated. It usually occurs 10 days and 4 weeks after symptom onset, rarely before 5 days or after 5 weeks. Factors that identify those at high risk for developing coronary involvement are male gender, age less than 1 year, prolonged fever and inflammation and other overt evidence of myocarditis. Additionally, aneurysms of other arteries (axillary, femoral, popliteal) though rare, also identify those at higher risk for coronary involvement.

Abnormalities of the coronary arteries include mild ectasia with perivascular inflammation detected on echocardiography, or true aneurysmal dilation that may either be saccular or fusiform in shape. Patients who develop giant coronary aneurysms (>8mm internal diameter) have the worst prognosis for resolution, and are at greatest risk for coronary thrombosis, stenosis or rupture, with possible subsequent myocardial infarction. Although infrequent, a high index of suspicion must be maintained for signs of myocardial ischemia or infarction. In pre-verbal children and infants, early anginal symptomatology is often non-specific and includes agitation, inconsolable crying, poor feeding and vomiting. In the full-blown picture, these may progress to frank congestive heart failure, cardiovascular collapse and shock. If left untreated, about half of those patients with coronary aneurysms will experience spontaneous resolution. Therapy with intravenous gamma globulin reduces the incidence of coronary involvement to approximately 3%.[12]

Table 2.—Differential Diagnosis of Kawasaki Disease: Diseases and Disorders with Similar Clinical Findings

Measles
Scarlet fever
Drug reactions
Stevens-Johnson syndrome
Other febrile viral exanthemas
Rocky Mountain spotted fever
Staphylococcal scalded skin syndrome
Toxic shock syndrome
Juvenile rheumatoid arthritis
Leptospirosis
Mercury poisoning

Therapy

After the diagnosis is established, initial therapy is directed at reducing the inflammatory response. Subsequent therapy is designed to prevent coronary thrombosis by inhibiting platelet aggregation. The beneficial effect of intravenous gammaglobulin (IVGG) was first demonstrated in Japan[13] in 1984. Before that, high dose aspirin therapy was the accepted modality. Subsequent multicenter randomized controlled trials in the US have demonstrated fewer coronary arterial abnormalities 2 weeks after enrollment when given as a single 2gm/kg dose.[12] These children also had more rapid defervescence (generally less than 24 hours) and return of acute phase reactants to

Table 3.—Other Clinical and Laboratory Findings

Cardiac findings	
Pancarditis, in early states of disease	
Coronary artery abnormalities, usually beyond 10 days of onset of illness	
Non-cardiac findings	
Musculoskeletal system	Respiratory tract
Arthritis, arthralgia	Preceding respiratory illness
	Otitis media
Gastrointestinal tract	Pulmonary infiltrates
Diarrhea, vomiting, abdominal pain	Other findings
Hepatic dysfunction	Erythema and induration at Bacille
Hydrops of the gallbladder	Calmette-Guerin (BCG) inoculation site
	Auditory abnormalities
Central nervous system	Testicular swelling
Extreme irritability	Peripheral gangrene
Aseptic meningitis	Aneurysms of medium-sized noncoronary arteries
Laboratory findings	
Neutrophilia with immature forms	Hypoalbuminemia
Elevated erythrocyte sedimentation rate	Elevated serum immunoglobulin E
Positive C-reactive protein	Thrombocytosis
Elevated serum alpha-1-antitrypsin	Proteinuria
Anemia	Sterile pyuria
	Elevated serum transaminases

normal. These multicenter studies evaluated patients treated within the first 10 days of illness, but anecdotal reports and small series have shown efficacy of IVGG administered as late as 4 weeks into the illness.

High-dose aspirin therapy (80-100mg/kg/day divided QID) is given along with IVGG and continued until the patient has become afebrile. Once afebrile, aspirin is reduced to a single daily dose of 3-5mg/kg/day as an anti-platelet, anti-thrombotic agent. In those patients whose coronary arteries are normal, low dose aspirin is continued until all signs of inflammation (platelet count and ESR) have returned to normal, generally 6 to 8 weeks from the onse t of symptoms. Those patients with persistent coronary abnormalities should remain on low-dose aspirin indefinitely. Those rare patients with giant aneurysms or coronary stenosis should be considered for therapy with dipyridamole and/or Coumadin.

The mechanism of action of IVGG is unclear. It may attenuate the patient's immune response, with particular effects on both B and T cell lymphocytes and down regulation of their associated lymphokines. Alternatively, it may act as a "blocking antibody" by providing a specific antibody against an etiologic agent or toxin. After treatment with IVGG, most patients demonstrate rapid defervescence and resolution of the other clinical manifestations. Some patients experience persistent or recurrent fever and should be considered for re-treatment with IVGG. Patients who present beyond the 10th day of illness should probably receive IVGG if they have signs of ongoing inflammation or evolving coronary artery disease. Difficulties are particularly encountered with infants less than 6 months of age who do not fulfill the standard criteria for the diagnosis. These young infants are at highest risk of coronary aneurysm formation, and treatment with IVGG should be based on clinical judgment.

Long Term Therapy: Those patients with residual coronary artery abnormalities noted on two-dimensional echocardiography or by angiography, should remain on lifelong antiplatelet agents and be followed by a pediatric cardiologist. The rare patient with coronary stenosis may require coronary artery bypass grafting. Long-term prognosis is especially unclear for patients whose initial coronary abnormalities appear to have resolved, and those patients who did not manifest signs of carditis or coronary involvement. There is evidence that aneurysms resolve through a process of intimal proliferation. Evaluation by intracoronary ultrasound reveals luminal narrowing of a significant degree.[14] These "healed" coronary vessels may be at increased risk for the development of atherosclerosis. Those without apparent findings on echocardiography may experience microvascular abnormalities that alter coronary reactivity. It would seem prudent to maintain follow-up every 1 to 2 years evaluating the electrocardiogram for signs of ischemia. Annual or biannual exercise stress testing may be helpful in identifying those patients at highest risk for coronary insufficiency. Additionally, this serves as an opportunity to reinforce the American Heart Association guidelines for a well-balanced, low fat diet, regular exercise, smoking avoidance and blood pressure control in these patients, to minimize their risk of developing atherosclerotic coronary disease. These issues remain unresolved, and should become clearer with ongoing long-term natural history studies.

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Childhood Lead Poisoning

James G. Linakis, PhD, MD

. . . studies have shown that young people with higher lead levels in childhood subsequently had a markedly higher risk of dropping out of high school, lower class standing in high school, increased absenteeism, lower vocabulary and grammatical-reasoning scores, and poorer hand-eye coordination.

Lead has been mined since at least 6500 BC and reports of its toxicity date back to as early as 250 BC. Yet for hundreds of years lead poisoning was thought to be an infrequent cause of illness primarily confined to adults. It was not until 1908 that childhood lead poisoning was first reported in the pediatric literature by an Australian house officer at the Brisbane Children's Hospital, A.J. Turner, and his chief, J. Lockhart Gibson. Six years later, childhood lead poisoning was described for the first time in the US, and although Turner had described paint as the source of the lead in his cases, it required another 70 years, until 1978, to gain passage of legislation banning lead from household paint in this country. Today, the number of American homes currently estimated to contain lead paint is slightly less than 60 million, representing 74% of privately owned, occupied housing units in the US. Indeed, 14 million or more children less than 7 years of age live in the houses with the highest concentrations of lead, and contrary to usual beliefs, white children from 6 months to 6 years of age constitute the largest group of children at risk in the US.

Absorption and Fate of Lead

While lead poisoning certainly can adversely affect adults, its greatest impact is on children, who are more likely to put their fingers and other objects that may be laden with lead-containing dust into their mouths. Furthermore, once lead has been introduced into the GI tract, infants and young children absorb significantly more ingested lead than adults—up to 15% in well-nourished children and up to 50% in an iron-deficient child. Once absorbed, about 60% of a dose of lead is excreted in the urine quickly. The remainder is distributed to the blood, soft tissues and bone, establishing a relatively steady state within a few days after ingestion.

At this point, 5% to 10% of the nonexcreted lead is in the blood, 10% to 20% in soft tissues and up to 90% in bone. However, it is important to remember that lead is in relative equilibrium, with constant small shifts among compartments. As a result, if lead is removed from one compartment, shifts will occur among compartments. Moreover, blood levels of lead do not necessarily represent levels in any of lead's target organs.

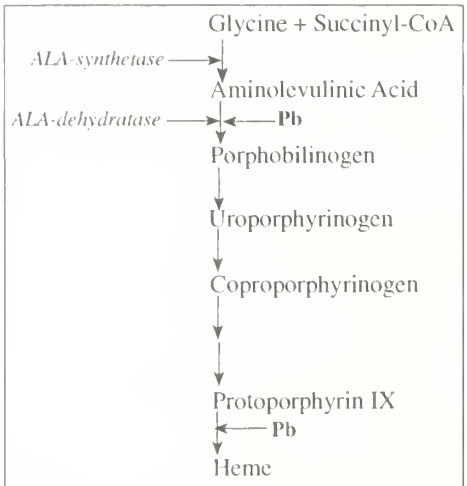

Fig 1.—Lead effects on heme synthesis. Pb, site for lead effect.

Two to four weeks after lead ingestion, renal excretion of lead dwindles to a tiny fraction of the total body burden of lead, and the blood lead level continues to decline very slowly, reaching a constant level after about 1 month. Obviously, that level will depend upon the amount of lead ingested.

Effects of Lead

Lead affects many organ systems. Most notably, lead is an enzymatic poison that preferentially binds to the sulfhydryl groups of polypeptides, particularly metal-containing enzymes, thereby exerting effects on a number of biochemical pathways. Most well described is its effects on heme synthesis. Many of the major steps of heme synthesis are catalyzed by metal-containing enzymes, and thus are sensitive to lead (Figure 1). For example, the step involving oxidation of δ-aminolevulinic acid (ALA) by ALA dehydratase to porphobilinogen has been shown to be inhibited *in vitro* by lead concentrations as low as 10 Og/dl, a level previously thought to be harmless.

Perhaps the best known toxic effect of lead on heme synthesis is its effect on the conversion of protoporphyrin IX (free erythrocyte protoporphyrin, FEP) to heme. Inhibition of this reaction is sensitive to lead concentrations as low as 25 Og/dl. Because of this, FEP was used until recently as the most common means for screening for lead poisoning. However, since lead levels lower than 25 Og/dl are now known to be toxic, the FEP is no longer considered an adequately sensitive screening tool.

Several other consequences of lead poisoning have been described and are summarized in Table 1. Among the most worrisome of lead's adverse effects is its effect on the nervous system, particularly the developing nervous system. In fact, only recently has the full spectrum of these problems come to light. Histopathologically, lead exposure has been shown to result in demyelination of axon sheaths, reduction in dendrite formation, interference with neurotransmission and calcium transport, and in severe cases, precipitation of ribonucleoprotein with resulting cell death, tissue necrosis and cerebral edema. Clinically, this can translate into seizures, coma and

ABBREVIATIONS USED:
ALA: Aminolevulinic acid
BAL: British anti-lewisite
CDC: Centers for Disease Control
EDTA: Calcium disodium edetate
FEP: Free erythrocyte protoporphyrin
G6PD: Glucose-6-phosphate dehydrogenase
GI: Gastrointestinal
IQ: Intelligence quotient
LFT: Liver function test
Pb: Lead

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Table 1. Partial summary of lead effects in children.

Blood Lead Level (µg/dl)	Effect
<10	Transplacental transfer; neurodevelopmental toxicity
15-20	Erythrocyte protoporphyrin elevation; Nerve conduction velocity deficits
25-40	Vitamin D metabolism impairments; Anemia secondary to decreased heme synthesis
45-70	Colic; nephropathy; peripheral neuropathy
75-100	Encephalopathy

even death at levels greater than 80 Og/dl, and more subtle consequences such as decreased nerve conduction velocities with sensorineural hearing loss at considerably lower levels.

Perhaps the effect of lead to capture the greatest amount of attention in recent years is its effect on neuropsychiatric function, most notably IQ and behavior. Indeed, the literature now contains more than 20 studies from at least 8 countries that demonstrate an adverse consequence of exposure to low levels of lead on neuropsychiatric function.

A few summary statements may help in putting the findings into perspective. First, the neurodevelopmental impact of lead seems to be more directly correlated with the age and duration of poisoning than with the height of the lead level at any given point, and several studies have demonstrated that comparatively small elevations in lead levels at 2 years of age are associated with significant impairments in intellectual and academic performance. Although this impairment has been well demonstrated to occur with lead levels as low as 10 Og/dl, no specific threshold for this effect has been identified. In other words, the effect on intellect may be present at levels significantly lower than 10 Og/dl. The extent of the impairment is somewhat difficult to ascertain since the investigations are variable, but overall, based on analyses of several of these studies, it appears that there may be an average decrease of 1/4 of an IQ point for each 1 Og/dl increase in lead level. This suggests that children with levels that were previously considered low (15-20 Og/dl) may, in fact, have 4-5 point deficits in their IQ. For many, on first consideration, a deficit of 4-5 points on various tests of neurobehavioral and cognitive functioning seems relatively innocuous when considered in terms of any individual child. However, when applied to populations of children, a 4 to 5 point *decrease* in mean IQ translates into a greater than 50% *increase* in the number of children scoring the borderline range of 80. At the same time, such a downward shift in functioning would result in a near total absence of children who achieved superior scores (IQ > 125).

As mentioned above, IQ is not the only aspect of neuropsychiatric function that appears to be adversely affected by lead. There have been several reports of behavioral effects, such as hyperactivity and attention deficits, and these effects on behavior appear to last beyond childhood. For example, studies have shown that young people with higher lead levels in childhood subsequently had a markedly higher risk of dropping out of high school, lower class standing in high school, increased absenteeism, lower vocabulary and grammatical-reasoning scores, and poorer hand-eye coordination.

Sources of Lead

Most lead poisoning is a result of ingestion of lead based paint. In fact, it used to be thought that consumption of chipping and peeling paint was the prerequisite for significant blood lead levels. While ingestion of paint chips containing lead is unquestionably a high risk behavior for developing lead toxicity, current cases of lead poisoning are more commonly the result of ingestion of dust and soil contaminated with lead from paint that has flaked or chalked as it aged. Consequently, we are seeing more children whose lead source is from dust within their homes and from the soil outside, which frequently contains lead in the top 1 to 2 inches. Most frequently, this lead is ingested through the normal hand to mouth activity of toddlers and children. Furthermore, it is important to note that the lead contained within soil is not biodegradable.

A particular mode of lead exposure that has become significantly more common in the past decade is the renovation of older homes. Individuals who are present during such construction, which commonly involves sanding, scraping and demolition of structures containing lead-based paint, are particularly susceptible to the development of lead intoxication unless specific precautions are taken. Indeed, we have seen a nearly 25% increase over the past seven years in the number of referrals of children and pregnant women whose lead poisoning is from this source.

Water has also been implicated as a contributor to elevated blood concentrations of lead. Fortunately, in Rhode Island and Massachusetts lead is not present in significant quantities in ground or surface water. Instead the lead that is present in water originates in the distribution system—lead pipes, lead connectors, lead-soldered joints in plumbing and lead containing brass fixtures. In most cases water, by itself, is not the cause of high blood lead levels, although there have been reported cases of lead poisoning in infants whose formula was prepared with lead-tainted water.

Other sources of lead are considerably less common but deserve consideration when the more common origins have been excluded. These include various non-Western medicines (eg, alarcon, alkohl, azarcon, Bali Goli); non-Western cosmetics (surma or kohl); industrial sources (such as smelting, lead storage battery fabrication or disposal, brass foundries, bridge construction, jewelry, electronics); hobbies (manufacture of fishing sinkers, reloading ammunition, fabrication of stained glass, furniture refinishing, pottery glazing) and some South or Central American pottery or cooking ware.

Screening

The Centers for Disease Control (CDC) has repeatedly redefined what it considers acceptable blood lead levels. At the end of 1991, the CDC concluded that any level over 10 Og/dl requires intervention. In Rhode Island, nearly half of the children

Table 2.—CDC recommended screening intervals for lead poisoning.

Age (months)	Risk Level	Blood Lead Level <10 µg/dl	10–14 µg/dl	>15 µg/dl
6–36	High	6 mo.	3–4 mo.*	3–4 mo.
9-36	Low	12 mo.	3–4 mo.	3–4 mo.
37–72	High	12 mo.	12 mo.	3–4 mo.
37–72	Low	May Discontinue**		3–4 mo.

* Switch to annual screening after: 2 consecutive results <10µg/dl or 3 consecutive results <15µg/dl

** Provided all screenings are < 15µg/dl before age 36 months and no change in environmental conditions.

under 6 years old, or over 34,000 children, screen above the CDC acceptable level of 10 Og/dl. Furthermore, an estimated 2,000 to 3,000 have levels over 20 Og/dl, and as many as 80% of homes in Rhode Island may contain lead-based paint.

The 1991 CDC statement was intended to move us into an era of *primary* prevention efforts for lead poisoning, that is, elimination of lead hazards before children are poisoned. Unfortunately, it is quite apparent that we are still several years from such an approach, and, in fact continue to deal with lead through a strategy of *secondary* prevention, that is, by screening susceptible children to identify those with lead poisoning, and then treating them.

The current approach to screening is to identify all children who are at risk for lead poisoning and then screen them. In 1991, the CDC concluded that almost all US children are at risk for lead poisoning, and suggested that the national goal should be to screen all children unless it can be shown that the community in which a child lives does not have a childhood lead poisoning problem. Although the recommendation for universal screening has been controversial in some parts of the country, in New England virtually no community is without a lead poisoning problem, and thus universal screening is an appropriate strategy.

Based on CDC guidelines, the state health department has established priority groupings for screening children from 6 months to 6 years of age (Table 2). These groupings specify a recommended screening interval based on age, risk category and results of previous blood lead levels. Obviously, children at highest risk for lead poisoning are the highest priority for screening. For purposes of determining risk, a series of 5 questions can be asked at each office visit (Table 3). Any positive response to one of these questions indicates a high-risk status. In addition, children with developmental delays, especially those with pica, deserve screening at least on a yearly basis, regardless of age.

Before the 1991 CDC guidelines, the FEP was used to screen for lead poisoning. From a screening standpoint, the FEP was a nearly ideal test since it is quick and easy to perform and inexpensive. Furthermore, when the 1985 CDC guidelines for lead poisoning were used (Pb > 25 Og/dl), an FEP > 35 Og/dl had a 73% sensitivity. With the new CDC guidelines, however, we are attempting to identify children with lead levels as low as 10 Og/dl. In this setting, the FEP has a sensitivity of only 26%. As a consequence, blood lead concentrations have become the standard for screening for lead poisoning. (The FEP is still useful for determining chronicity of exposure and thus should be obtained in children with elevated lead levels.) There are currently a number of analytical techniques available to make accurate blood lead measurements, although all are more difficult and lengthy to do than the FEP. Of note, even the most proficient of labs can only measure blood lead levels to within several Og/dl of the true value. Thus, the blood lead level reported by a laboratory may be several Og/dl higher or lower than the actual blood lead level, and as a result, trends in lead levels should not be considered significant unless the magnitude of the change is > 5 Og/dl.

Table 3. Risk Assessment Questionnaire

Does the child:

1. Live in or regularly visit a house with peeling or chipping paint built before 1960?
2. Live in or regularly visit a house built before 1960 with recent, ongoing, or planned renovation or remodeling?
3. Have a brother or sister, housemate, or playmate being followed or treated for lead poisoning?
4. Live near an active smelter, battery recycling plant, or other industry likely to release lead?
5. Live with an adult whose job or hobby involves exposure to lead?

Management

Guidelines have also been established for specific action to take according to blood lead level (Table 4). Short of chelation therapy, several interventions can be implemented effectively at lead levels as low as 10 Og/dl. These include dietary manipulations such as iron supplementation (iron repletion decreases lead bioavailability), environmental maneuvers (eg, dust abatement, hand washing, regular rinsing of toys exposed to lead dust, etc.) and education.

In instances where chelation therapy is required, the above interventions should still be instituted (although iron therapy should be interrupted during chelation therapy). Several other actions should be taken also. Foremost, the child requiring chelation therapy should be removed from the lead-contaminated environment to one that is lead-safe until the original environment has been deemed lead safe by state inspectors. This point cannot be overemphasized—the lead-poisoned child must be moved to a safe environment if his/her lead poisoning is to be effectively treated. The child certainly should not be in the home where deleading or renovation is going on, since this is a particularly high risk situation for further lead exposure. In some instances, ensuring a lead safe environment will mean admitting the child to the hospital.

Chelation therapy is the mainstay of treatment of children with elevated lead levels. The principle of chelation is relatively straightforward: lead binds to the chelating agent with a subsequent increase in urinary or biliary excretion.

Currently, four agents are used to chelate lead clinically. British Anti-lewisite (BAL) was developed in Great Britain during World War II as an antidote for the war gas, lewisite. Two molecules of BAL combine with one atom of lead to form a stable complex that undergoes both fecal and urinary excretion. BAL diffuses into erythrocytes and is distributed in all tissues including the brain. It comes suspended in peanut oil and thus must be given as an intramuscular injection. It may induce hemolysis in G6PD-deficient patients and forms a toxic complex with iron and thus should not be given concomitantly. BAL also has a relatively high incidence (30% to 50%) of minor side effects including mild febrile reactions, transient transaminase elevations, nausea, vomiting, headache and conjunctivitis.

Calcium disodium edetate (CaNa2 EDTA) works by exchanging its calcium atom for the lead atom resulting in a 20 to 50-fold increase in urinary lead excretion.

Table 4. Action table for elevated blood lead concentrations.

	Blood Lead Level			
	15-19µg/dl	20-44µ/dl	45-69µ/dl	>70µg/dl
Venous Confirmation		X	Urgent	Emergent
Medical Treatment		X	Urgent	Emergent
Consider Fe Supplementation	X	X	Contraindicated during chelation therapy	
Education & Nutrition Counseling	X	X	X	X
Environmental Investigation & Abatement	X*	X	Urgent	Emergent

* When consecutive tests obtained 3-4 months apart are 15–19µg/dl, environmental inspection and abatement should be conducted.

EDTA can be given intramuscularly, although continuous intravenous infusion is preferable. The kidney is the primary site of EDTA toxicity. The urine should be monitored for protein and casts in patients receiving this medication.

D-Penicillamine is a weak oral chelator that is approved by the FDA for treatment of Wilson's disease, cystinuria, and severe, active rheumatoid arthritis. Although not officially approved for the treatment of lead poisoning, it has been shown to be effective for the treatment of blood lead concentrations <45 ○g/dl. Minor side effects are common (33%) including rashes, transient leukopenia, thrombocytopenia, hematuria, and proteinuria. Side effects may be reduced by starting with a decreased dose and increasing the dosage of medication gradually over 2 to 3 weeks.

Succimer is the newest chelating agent available for lead poisoning. First used in the treatment of schistosomiasis, the FDA approved succimer in 1991 for the treatment of lead levels between 45 and 70 ○g/dl. It is an oral chelator with high selectivity for lead; unlike other chelators, its ability to chelate essential trace elements is low. Treatment with succimer results in an increase in renal excretion of lead that quantitatively is at least comparable to, if not better than that of EDTA. Since it is a comparatively new drug, its full toxicity profile is still not known, although to date, GI effects (including nausea, vomiting, diarrhea and transient elevations in LFTs) and transient leukopenia have been reported.

Treatment Guidelines

In discussing specific treatment guidelines, lead poisoning can be divided into four categories of severity: 1) symptomatic; 2) severe asymptomatic; 3) asymptomatic with moderately high blood lead; and 4) mild asymptomatic.

1. Symptomatic lead poisoning may present with encephalopathy or with non-encephalopathic symptoms. Patients with encephalopathy may exhibit coma, seizures, bizarre behavior, ataxia, refractory vomiting, or an alteration in consciousness and nearly always have a lead level >100○g/dl. Nonencephalopathic symptoms include decreased play activity, anorexia, sporadic vomiting, intermittent abdominal pain, and constipation, and patients with these symptoms generally have levels >70○g/dl. Symptomatic lead poisoning should be considered a medical emergency and deserves treatment in a center with pediatric intensive care facilities, since neurologic status and fluid balance are extremely fragile in these patients and must be monitored carefully. At initial diagnosis, radiologic examination of the abdomen to look for lead paint chips in the GI tract is especially appropriate in these patients since there is evidence in animals studies that certain chelating agents (EDTA, BAL, penicillamine) may enhance the gastrointestinal absorption of lead. In patients with positive abdominal radiographs a cathartic should be administered or whole bowel irrigation undertaken to empty the GI tract before beginning chelation therapy.

Chelation in symptomatic patients involves combination therapy with BAL and $CaNa_2$ EDTA. An initial dose of BAL at 4mg/kg IM (with 0.5% procaine) is given 2 to 4 hours before starting EDTA and repeated every 4 hours. EDTA is administered as a continuous infusion at 75mg/kg/24 hours for a full 5-day course. Although some specialists recommend continuing intramuscular BAL for the full 5 days, we have found that lead levels are generally sufficiently low that BAL can be stopped after 2 to 3 days (ie, if lead level is less than 40○g/dl).

Since the kidney is at risk from both lead and chelation therapy, fluid balance deserves careful attention in children undergoing chelation therapy, and it is important to establish good urine flow in all patients. Obviously fluid balance becomes a significant challenge in patients with lead-induced encephalopathy since the potential for cerebral edema is substantial.

Although a 5-day course of chelation therapy usually brings the blood lead level down to much lower levels, it is important to remember that about 90% of the total body burden of lead is in the bone and that chelation therapy removes lead from the bone only indirectly. Only after lead is removed from blood and soft tissues is there a relatively gradual shift of lead out of bone. As a consequence, in the weeks following chelation therapy, blood lead concentrations will frequently rebound, making multiple chelations necessary.

2. Severe asymptomatic lead poisoning entails levels >70○g/dl, and should be managed in an urgent fashion, since these patients are at great risk for the development of lead encephalopathy. Management is similar to that for symptomatic lead poisoning and patients are treated with BAL and EDTA, although at somewhat lower levels—3mg/kg/BAL dose every 6 hours and EDTA at 50mg/kg/24 hr continuous infusion. Good urine output remains a priority and patients must be carefully monitored for the development of cerebral edema.

3. Asymptomatic patients with moderately high lead levels (Pb = 45-70○g/dl) constitute a relatively large group of patients, and while their levels are not acutely as dangerous as higher levels, they must still be managed aggressively. Although these patients are frequently managed as outpatients, unless it is clear that the lead source has been identified and the child removed from it, these children should be hospitalized. In the past, children with lead levels in this range were most commonly treated with EDTA. However, most children with these levels can now be treated orally with succimer. Initial studies have shown succimer to be at least as effective as EDTA, although in both cases, rebound of lead levels is common after a course of therapy and thus multiple chelations are commonly required.

4. Probably the most controversial treatment group involves those children with lead levels between 20 and 45○g/dl. This grouping includes many children who have only recently been defined as lead poisoned by the new CDC standards. Part of the controversy arises from the fact that a large cohort of children has been identified as being at risk from the degree of their lead

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exposure, while at the same time, there are no controlled data demonstrating the effectiveness of chelation therapy in decreasing the adverse effects of low levels of lead on the child's cognitive function. In other words, we know that lead levels permitted to linger in this range are harmful, but, at present, we can only assume that reducing those levels is beneficial.

It was previously popular (and still is, at many institutions) to submit children with lead levels in this range to a lead mobilization test. This test is performed by giving a single IM or IV dose of EDTA, followed by a timed quantitative urine collection for lead over 6 to 8 hours. The rationale is that if a lead diuresis occurs in response to this test dose of EDTA, then the patient is a candidate for further administration of the drug. Since there are now oral chelating agents that are probably as effective in treating lead levels between 25 and 45Og/dl as EDTA, many clinicians no longer perform the lead mobilization test. Instead, levels in this range are treated with either d-penicillamine (30 mg/kg/day divided into 3 daily doses for 1 to 3 months) or succimer (10 mg/kg/dose t.i.d. for 5 days followed by 10 mg/kg/dose bid for 14 days). As mentioned earlier, these medications can safely be used in the outpatient setting, as long as the child is not at risk of continued lead exposure. It must be reiterated, however, that although penicillamine has been shown to be effective in treating lead levels in this range, and is used widely for that purpose, it is not specifically approved by the FDA for this indication. Similarly, while succimer is approved by the FDA for treatment of levels of 45-70Og/dl, there is, to date, only a single published study demonstrating its effectiveness at lower levels, although many clinicians are currently using it primarily at those levels and with what is apparently a high degree of success.

Summary

Lead poisoning has been referred to as the most important environmental health hazard for children in New England. Medical professionals are in a unique position to perform a number of interventions that could make a lasting impact. First, physicians and nurses, particularly in the areas of pediatrics and family medicine, can provide anticipatory guidance to all families with young children. Lead poisoning, in contrast to long held beliefs, is an affliction that affects all socioeconomic groups. Parents should thus be informed regarding sources of lead, including occupational and hobby sources, and basic nutritional and abatement information should be provided. Second, health care workers should encourage lead screening in appropriately aged children at recommended intervals based on known risk factors. Once a blood lead concentration greater than 20Og/dl has been obtained in a child, treatment or referral to an established lead clinic should be undertaken in a timely fashion. For children with low or moderate lead levels, many pediatricians or family physicians prefer to supervise their patients' treatment, including chelation therapy. For children with higher levels or in instances when the health care professional elects to refer, there are several lead clinics throughout New England whose clinicians are experienced in the treatment of childhood lead poisoning. Finally the medical profession needs to publicly recognize, as child advocates, that lead poisoning is one of the most common pediatric health problems in the United States and that it is entirely preventable. Fortunately, after many years and much hard work, Rhode Island finally has laws that start to deal with the lead problem in an appropriately aggressive fashion. We now need to make it clear that we expect those laws to be enforced and we can also support the strengthening of those laws so that the lead hazard is removed once and for all.

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Rhode Island Department of Health
Barbara A. DeBuono, MD, MPH, Director

Edited by Judith Feldman, MD,
John P. Fulton, PhD, and Bela Matyas, MD

Foodborne Illness in Rhode Island

Ernest Julian, PhD

Foodborne illness is a significant problem in the United States, striking 24–81 million Americans per year at an estimated cost of $8–23 billion. Most foodborne illness probably goes unreported, because the victims do not associate their symptoms with food consumption. Prompt identification and reporting of foodborne illness can reduce the overall incidence of illness, however. Physicians play a critical role in limiting foodborne outbreaks. Through patient education, they may also contribute significantly to prevention efforts.

Problem: Infection/Intoxication

Foodborne pathogens and contaminants are ubiquitous. Many favorite foods provide ideal growth media. Although preventive techniques of food preparation, handling, and storage are simple enough (washing, heating, cooling, preventing contamination), they are sensitive to environmental conditions (hygiene, temperature, new organisms, equipment design and maintenance) and are easily violated. Mass food preparation increases the potential for harm.

Solution: Prevention

Reducing foodborne illness is one of Rhode Island's Year 2000 health objectives. Two preventive strategies will be employed in this endeavor, policy development and consumer education. Recent state policies include:

- Mandatory training and certification in food safety for food operation managers;
- Mandatory refrigeration of raw eggs in the food industry;
- Mandatory thorough cooking of ground beef before sale for consumption by children under age 12 (adults may purchase meals containing rare meat products, but they must receive consumer advisories concerning the risks of eating undercooked food).

Physicians may play an important role in consumer education. Food safety tips for consumers are listed in the attached tear-out section, which is intended for reproduction and distribution to patients. Persons at high risk of severe symptoms from foodborne illness, including pregnant women, infants, elders, and those suffering from food allergies, cancer, diabetes, liver disease or AIDS, should be special targets of consumer education. Physicians should also consider the following advisories for high-risk individuals:

- Patients with food allergies should be vigilant for hidden ingredients in food mixtures, such as peanut butter in chili.
- Patients with liver disease should not eat raw shellfish, to avoid the risk of illness and death associated with *Vibrio vulnificus*.
- Pregnant women should thoroughly reheat hot dogs and avoid all but the freshest luncheon meat. *Listeria monocytogenes*, a common contaminant of these products, may cause abortion.

Problem: Identification

Most victims of foodborne illness do not associate it with food consumption. Symptoms of foodborne illnesses (diarrhea, nausea, vomiting, sometimes fever) are similar to those of common viral infections, and may arise several hours, even days after eating. Also, many attacks of foodborne illnesses are mild. Physicians should be wary of unexplained gastrointestinal illness of at least moderate severity, especially if a number of individuals develop symptoms

Clip and Reproduce for Patients

Avoiding Foodborne Illness

Much of the vomiting and diarrhea that many of us suffer from time to time is really caused by what we eat. While most of us get better without lasting problems, some illnesses can be very serious, especially for pregnant women, infants, elders, and people with cancer, diabetes, liver disease or AIDS. Most foodborne illnesses can be avoided by doing a few simple things:

Shopping

- ÷ *Buy eggs, meats, cut melons, and other spoilable foods only if they are refrigerated. Buy these foods last and get them home quickly.*
- ÷ *Buy spoilable foods in small batches. Use quickly.*
- ÷ *Don't buy cans or jars with dents, cracks, or bulges.*

Storing

- ÷ *Refrigerate spoilable foods as soon as you get them home from the store.*
- ÷ *Check the temperature of your refrigerator. It should be 40o F or lower.*

Preparing

- ÷ *If you are ill with diarrhea or vomiting, don't prepare food for others.*
- ÷ *Before preparing food always wash your hands well.*
- ÷ *Wash under the fingernails.*

Cooking

- ÷ *Cook well all eggs and meats, especially chicken and ground meat. Cooked eggs should not be runny.*
- ÷ *Use a food thermometer to make sure meats are well-cooked. Well-cooked meats have clear juices.*

Leftovers

- ÷ *Don't let food sit at room temperature after meals.*
- ÷ *Divide it into small batches and refrigerate it quickly. Then use it quickly. Reheat it well.*

within a short period of time and if unusual symptoms such as bloody stools are present. Stool specimens may assist greatly in identifying the cause of such illness.

Solution: Vigilance and Prompt Reporting

In 1993, a report of gastrointestinal illness in Rhode Island's Portuguese community led to the discovery of numerous illnesses in nearby Massachusetts. The ensuing investigation identified Lapis, a snail consumed raw, as the culprit. The product was found to be highly contaminated. More than 75% of persons consuming the product became ill. Rhode Island officials banned its import into the state, avoiding further illness.

In 1993, a Rhode Island physician was presented with multiple cases of gastrointestinal illness. Stool cultures were used to identify Enterotoxigenic *E. Coli*, which was promptly reported to the Rhode Island Department of Health. Epidemiologic investigation led to the discovery of a multi-state foodborne outbreak caused by contaminated carrots in airline meals.

In 1994, it was reported that five Johnston children had vomited within minutes of consuming frozen lemonade. The suspect lemonade was tested and found to contain high levels of copper and lead. High levels of copper may cause almost immediate vomiting. Further investigation revealed high levels of heavy metals in the frozen lemonade of other manufacturers. Equipment used to make the product was leaching metals into the highly acidic lemonade. Multiple lemonade outlets were closed until faulty machinery could be upgraded with parts which would not leach contaminants into the food product.

For further information about food safety, or to report suspected foodborne illness, suspicious food products, or improper food handling, call the Office of Food Protection at 401-277-2750. Cases of suspected foodborne illness may also be reported to the Department's Division of Disease Control at 401-277-2577.

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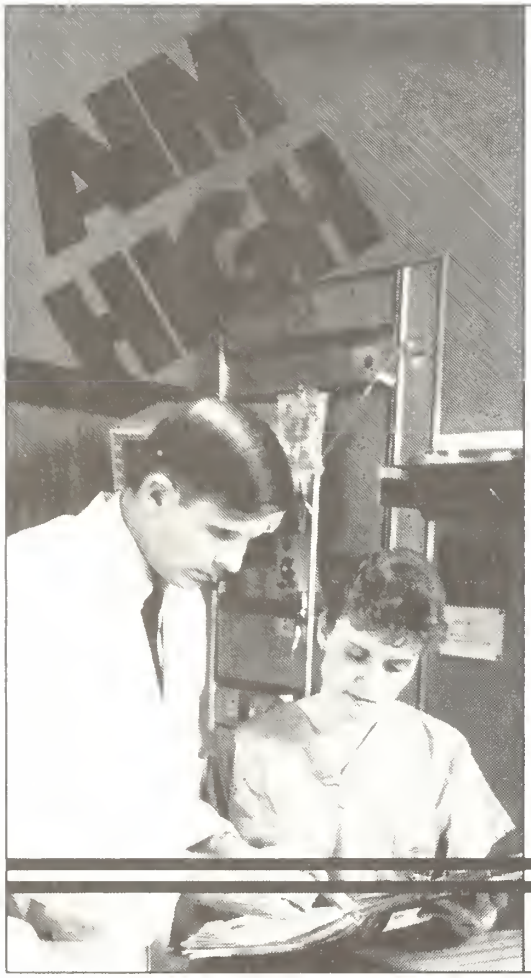

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THE RHODE ISLAND MEDICAL JOURNAL

The Official Organ of the Rhode Island Medical Society
Issued Monthly under the direction of the Publication Committee

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THE RHODE ISLAND MEDICAL JOURNAL HERITAGE

90 Years Ago (January 1905)

The lead editorial contends that infectious diseases are much more widely distributed than had been formerly supposed. In addition to the classically defined cases of infectious disease, the editorial notes, there also are numerous atypical, unrecognized and even subclinical cases. The author cites a recent Hartford school system study that isolated the diphtheria bacterium from 30% of children with mild sore throats. Other examples include the prevalence of asymptomatic typhoid in the military and scarlatina cases with but a transitory rash. Communicability, the editorial states, may arise just as readily from the atypical case or even from the clinically normal carrier. The editorial concludes: "Strict personal cleanliness is more important than disinfection. It is persons not things that are to be feared, and it is not persons in bed, but persons who are up and about who do the most harm."

Mary S. Packard, MD, describes two cases of chronic anemia with splenic enlargement. The first was a 30-year-old woman admitted to the hospital because she had vomited copious amounts of blood. The patient was then followed, intermittently, for more than 6 years, with both her profound anemia and splenomegaly persisting. The author believes, with Osler, that this represents a chronic response to some unknown toxin. The second case was a 46-year-old woman, severely anemic and with a yellowish tint to her skin. A diagnosis of pernicious anemia was entertained.

An article by Halsey DeWolf, MD, on mucous colitis avers that this condition is much more common than is supposed. The disorder, subacute or chronic in nature, is characterized by a well defined group of gastrointestinal and nervous symptoms, and is accompanied by mucus discharge from the bowels. The author analyzes the nature of the constipation or diarrhea, paraxysmal pains, discharge of mucus, deprression, and such "nervous phenomena" as headache, numbness and tingling of extremities.

50 Years Ago (January 1945)

The lead article is written by Albert H. Jackvony, MD, and represents his presidential address before the Providence Medical Association. The subject of this article, "What of the Doctor-Veteran?" is most appropriate since, in the judgment of the author, "we look forward to the end of World War II." The potential problems of the demobilized doctor are many. "Must I start from scratch again or can I hope to find some system which will insure me an income for my services during the first 6 to 12 months?" The author recognizes the importance of providing educational programs for the returning veteran, but expresses concern over the proposal that salaried positions be created for these colleagues. The author concludes with a group of recommendations including the formation of a War Veterans Committee.

Alex M. Burgess, MD, Elihu S. Wing, MD, Louis I. Kramer, MD, and Russel O. Bowman, PhD, discuss the renal complications of sulfadiazine therapy. They review, in particular detail, the records of 6 patients who developed some degree of oliguria following sulfadiazine therapy. Two expired, with autopsy evidence of tubular necrosis or precipitation of acetyl sulfadiazine in the renal tubules. The authors recommend the following: Sulfadiazine should not be used unless there is a specific indication for it; the drug should be avoided particularly in those who are dehydrated, in cardiac decompensation or with a history of renal damage.

Ambrose H. Lynch, DMD discusses the life and contributions of Horace Wells (1815–1848). This historic account of the dentist who discovered the anesthetic uses of nitrous oxide commemorates the centennial of the first documented occasion when a gas was used deliberately to neutralize the pain of surgery.

Peter Pineo Chase, MD, describes an unusual case of chronic appendicitis in a 29-year-old woman.

25 Years Ago (January 1970)

Joseph E. Cannon, MD, Director of Health of the state, speculates on the health care system some 5 years into the future, in the year 1975. He points, first, to the progress made in the preceding 5 years, including such advances as the devising of vaccines for measles and rubella, air pollution control programs in the state, a 2-year medical school at Brown, and five university-affiliated hospitals in the community, as well as the Medicare and Medicaid programs. In the future, the author believes, there will be a greater emphasis upon preventive interventions, and newer health-oriented technologies. He envisages cleaner air and waterways, greater protection of the natural resources, and governmental control of industrial wastes. He anticipates vast changes in the health care delivery systems and some methods by which health care costs may be controlled.

Russell B. Roth, MD, of the American Medical Association, discusses a proposal, called Medicredit, to provide a voluntary health care program for the nation.

Walter J. McNerney, MD, president of the National Blue Cross Association, ponders on what is happening to the health care system and declares that carriers, physicians and hospitals must develop fiscal discipline if expansion costs are to be tolerated.

The concept of peer review is discussed by Richard S. Wilbur, MD, vice president of the American Medical Association.

HEALTH BY NUMBERS

Rhode Island Department of Health
Barbara A. DeBuono, MD, MPH
Director of Health

Edited by Jay S. Buechner, PhD
Chief, Office of Health Statistics

Alcohol-related Mortality in Rhode Island, 1986-1990

The adverse social and health effects of alcohol use have been well documented. Alcohol use can create discord within families, increase absenteeism and decrease productivity in the workplace, cause chronic disease, and increase risk of injury events such as motor vehicle crashes.

A recent publication from the National Institutes on Alcohol Abuse and Alcoholism[1] provides national mortality data that allows intra-and interstate comparisons of the risk of alcohol-related death. County level death rates for the 5-year period 1986–1990 were determined for three categories of alcohol-related mortality: explicit mention of alcohol as underlying cause of death (eg, alcoholic cirrhosis of liver); diseases related to alcohol use (eg, malignant neoplasm of stomach); and alcohol-related injuries or adverse effects (eg, motor vehicle crashes). Deaths attributable to alcohol were estimated by applying alcohol-attributable fractions to each specific cause of death (eg, 0.42 for traffic fatalities). These fractions were national estimates based on research and did not vary by state or county. Children and young adults were excluded in the calculation for certain causes of death, such as diseases resulting from a long drinking history. Rates were age-adjusted to allow comparisons between areas with different age profiles.

Rhode Island ranked 37th among the 50 states and District of Columbia for overall alcohol-related mortality during 1986–1990 (30.3 deaths per 100,000 population per year), 15% below the US rate (35.7 per 100,000). However, the state's ranking within individual categories varied considerably. Rhode Island had the 14th highest mortality rate for deaths with explicit mention of alcohol as the underlying cause of death (7.6 per 100,000), the 17th highest rate for other alcohol-related disease (10.6 per 100,000), and was 49th for alcohol-related injuries/adverse effects (12.1 per 100,000). This latter figure is consistent with overall injury mortality rates, for which Rhode Island ranked 48th during the same time period.

Figure 1 illustrates mortality rates by category for New England states. Rhode Island had the highest death rate for explicit mention of alcohol, was second for alcohol-related diseases, and fifth for alcohol-related injuries/adverse effects.

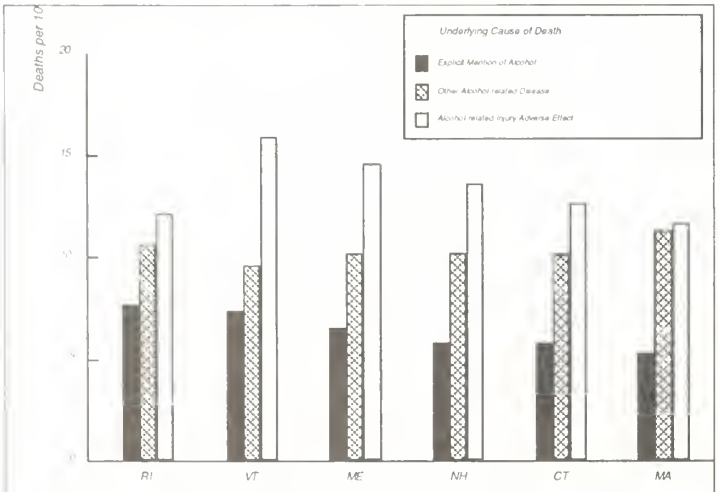

Fig 1.—Age-adjusted alcohol-related mortality rates, annual average, 1986-1990, New England states

Table 1 compares mortality rates of the five Rhode Island counties. For each of the three categories, Bristol County (comprised of Warren, Barrington, and Bristol) had the lowest rates. The largest difference was for alcohol-related injuries/adverse effects, where the mortality rate for Bristol County residents was 40% below the state rate. (Note that all Bristol County rates are potentially statistically unstable as they are based on a total of only 51 alcohol-related deaths during the 5-year period.) Providence County had the highest rate overall and for two of the three component categories.

The information presented shows a discrepancy between Rhode Island's high rate of acute and chronic alcohol deaths and its low rate of alcohol-related injury deaths. At the simplest level, it may be that factors associated with Rhode Island having a low overall injury mortality rate offset high rates of alcohol consumption. Some of these factors include: a relatively urbanized traffic system (high speed crashes are more likely to be fatal than low speed crashes); low firearm ownership rates; and relatively few swimming pools, high risk areas for drownings. Evidence of high rates of alcohol consumption in Rhode Island is obtained from recent surveys of the state's adult population (ages 18 and over). In 1993, Rhode Island ranked fifth among states in the percentage of adults who report chronic drinking (averaging two or more drinks per day), seventh in the percentage who report binge drinking (having five or more drinks on an occasion in the past month), and 10th in the percentage who report having driven after drinking excessively in the past month.[2]

Because of the high burden of mortality and morbidity caused by excessive alcohol use, modification of this behavioral pattern is the objective of a large and growing number of prevention and treatment programs at the state and local levels.

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2. National Center for Disease Prevention and Health Promotion. *Behavioral Risk Factor Surveillance System: 1993 BRFSS Summary Prevalence Report.* Atlanta, GA: Centers for Disease Control and Prevention; October 1994. (In 1993, 49 states and the District of Columbia participated in the BRFSS.)

Table 1.—Age-adjusted alcohol mortality rates, 1986-1990, by Rhode Island county (rates per 100,000 person-years)

County	All Alcohol-related Causes of Death	Explicit Mention	Other Diseases	Injuries/ Adv.Effects
Bristol	21.2	5.3	8.6	7.3
Kent	27.2	5.6	9.9	11.7
Newport	28.8	7.1	10.5	11.2
Providence	32.4	8.3	11.3	12.9
Washington	29.4	8.5	9.4	11.5
State	30.3	7.6	10.6	12.1

Submitted by Thomas W. Largo, MPH, Office of Health Statistics. Health by Numbers *is edited by Jay S. Buechner, PhD, and William J. Waters, Jr., PhD*

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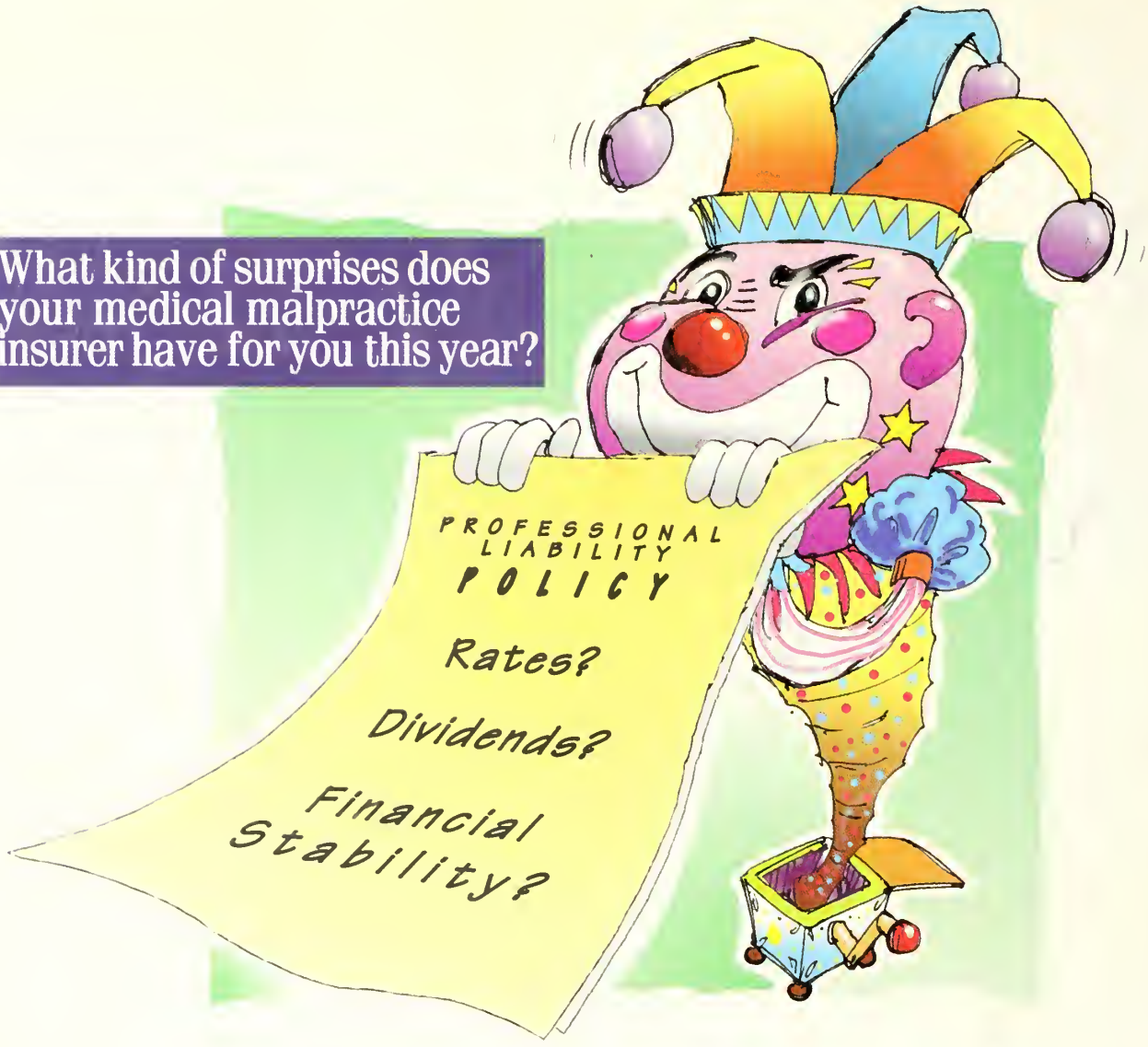

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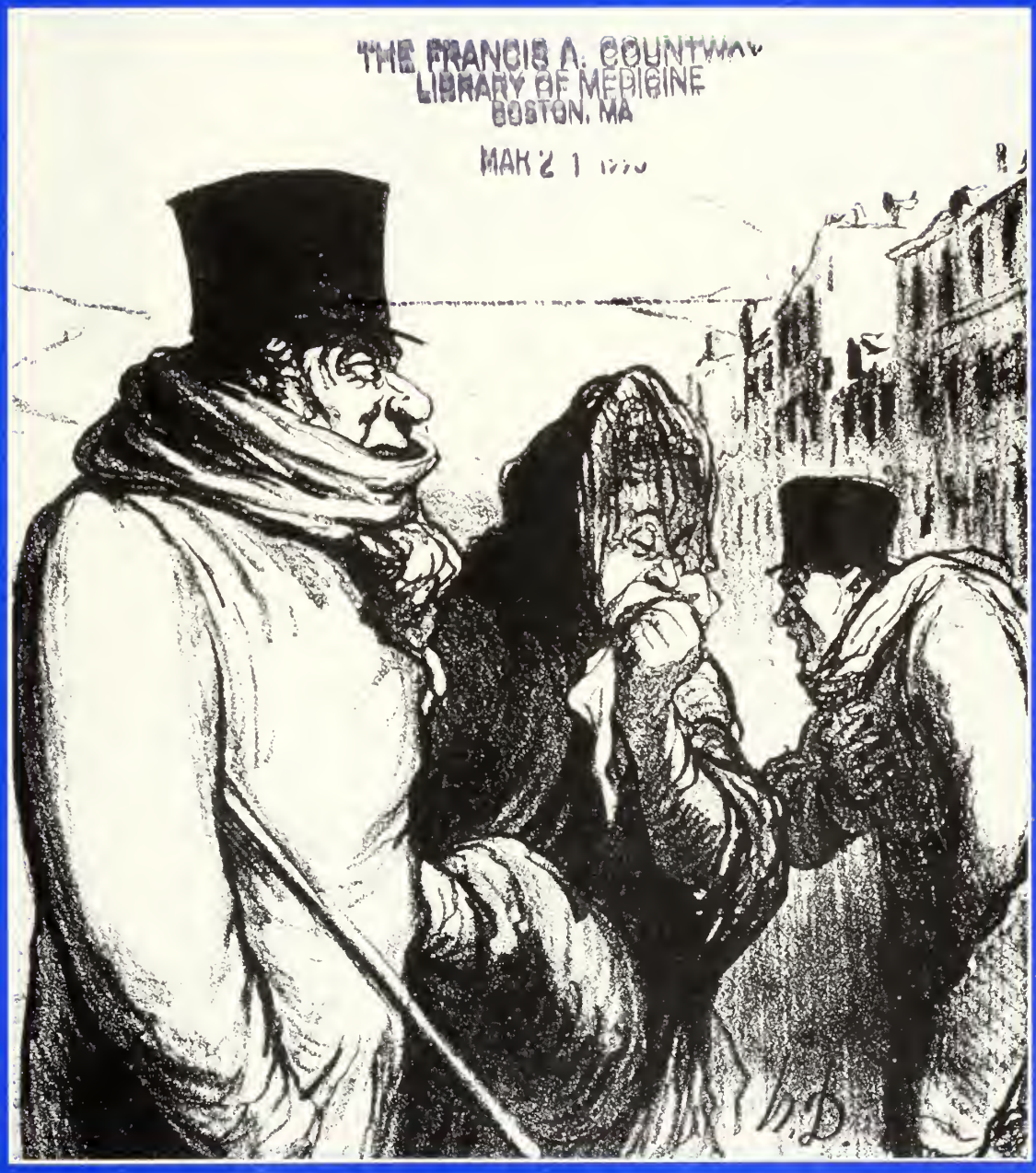

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Cover: Cartoon of Honoré Daumier entitled "Paris grippé" which appeared in the February 13, 1864 issue of *le Charivari.*

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COMMENTARIES

For Whom the Clock Ticks

The New York Times recently carried a brief item describing what it considered to be the prime candidate for the most useless electronic gadget of 1994, a product called LifeClock. Before activating this unique clock, each purchaser is asked to enter his/her current age and gender into the inner mechanism; the clock then begins the pitiless process of counting down the actual hours and minutes of life remaining, based upon life-table predictions for an average person of the entered age and gender. This inflexible timepiece thus ticks away its seconds relentlessly, the total residual time ever diminishing. Each morning the clock's owner is forced to note the shrinking supply of hours remaining, and it is not difficult to envisage him staring hypnotically at the waning numbers. The clock also provides 150 motivational messages. "If you have the time to read them," notes the *Times*.

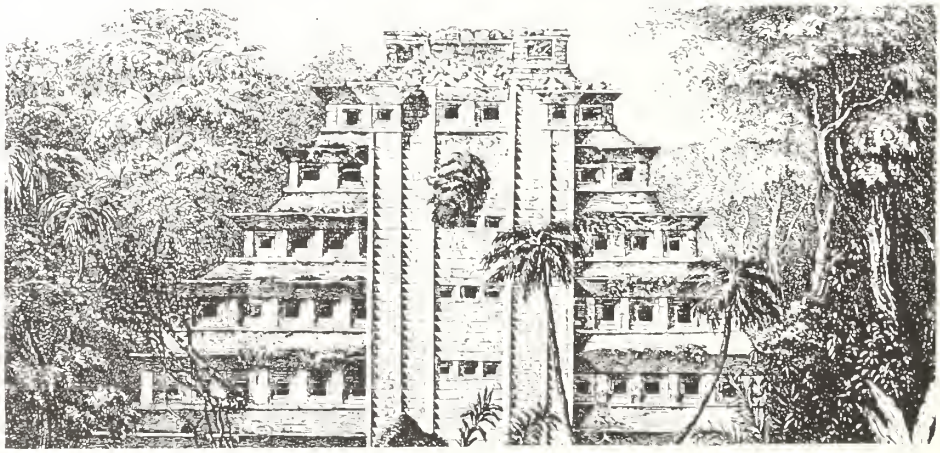
The *Times* is utterly wrong in considering this clock to be worthless. Truly, it is both timeless and timely. Instead of deriding it, the paper should herald this crude device as the creative forerunner of an important new trend, the outlines of which are now only dimly apparent to historians. Rather than rejecting it outright, the *Times* might rather have suggested embellishments to enhance the clock's basic actuarial function. For example, it might have required further variables to be entered (eg, the owner's ethnicity, marital status, profession, diet, body weight, yearly income), collective knowledge of which would permit the clock to offer a far more accurate prediction of anticipated life expectancy. And for those purchasers oriented to sports, the *Times* might have also recommended that a 2-minute final warning signal be added to this home aid.

Before discharging its awesome prophesies, the clock might even insist that its new owner first be submitted to all kinds of predictive clinical tests including the new ones for Alzheimer's disease, Huntington's disease and cancers of colon and breast. And when, in the next decade, the entire human genome stands revealed in all its pathophysiologic splendor, accurate predictions of future life span for each genic configuration will then be a matter of relative ease, impeded only by one's ability to pay for all of these complex tests. When we have reached such a state of future certainty, we can then respond to Macbeth's disquieting demand: "If you can look into the seeds of time, and say which grain will grow, and which will not, speak then to me."

Few of us would attend a basketball game if the final score were announced at the onset. For, regardless of how this advance information was obtained, the game would nonetheless seem "fixed." For many of us, the future should resolutely remain a random mystery, a time for wondrous happenings set in a Norman Rockwell tapestry. These same people, physicians not excluded, willfully prefer ignorance—sometimes called blissful—to any true insight into their personal futures. Portentious truth looms as an ominous rather than illuminating event. Indeed, as scarce as truth is, the supply has always exceeded the demand. The choice, then, rests between truth or blissful serenity. The truth can wait; after all, it is accustomed to waiting.

Clinical geneticists have repeatedly noted that carriers of certain *recessively* transmitted diseases (eg, cystic fibrosis, Tay Sachs disease) are enthusiastic advocates of new, identifying tests; similarly, the general public encourages the development of predictive genetic tests. On the other hand, the carriers of *dominantly* transmitted disorders (eg, Huntington's disease), who may themselves become victim to the disorder, tend to be far less enthusiastic. It depends, it seems, on whose genome is gored.

As we gain increasing insights into what will befall us—and perhaps when—the illusion of our independence, the captaincy of our souls, crumbles. Our deepest fears are then realized: that our time and mode of departure are all documented in a Grecian scenario the programming of which long predates us. Man, as Genesis tells us, has ever felt uneasy when the horizons of his knowledge expand suddenly; when knowledge, once forbidden, may stand revealed. Sooner or later, man fears, some critical threshold of enlightenment will be reached and a second departure from Eden will then be ordained. Some have warned that we are provoking nameless forces and that hubris, not ignorance, is our most implacable enemy. Mary Shelley's Dr. Frankenstein writes to a dear friend in these anguished words:



"Learn from me, if not by precepts at least by my example, how dangerous is the acquirement of knowledge." The ultimate issue for questing man, then, seems to be whether there are *any* fields of knowledge, analyses of which, *a priori*, are to be forbidden.

Society, of course, allows fleeting glimpses into the alleged future, such as those provided by astrologers and benign horoscope vendors. But a truly unblinking scrutiny of what is to come will force most of us, in company with Ebenezer Scrooge, to scramble terror-stricken back to the present.

To the cautious, then, predictive tests (or clocks) should be left for the imprudent ones. They feel, with Thoreau, that man is rich in proportion to the things he can afford to leave alone. In the absence of sure knowledge there is always hope. And hope, even if it is merely a dividend of willful ignorance, is still an indispensible element in the joy of living. Hope keeps new businesses, high school football teams and state lotteries flourishing. And Hope remains the state motto of Rhode Island.

To a small minority of others, hungry for insights into the future, these predictive tests represent a way of affirming man's destiny. Were life simple, we might then let each person choose; but inevitably there will be times when one person's future state of health can adversely affect the health of others and society will then demand a voice in determining who is to be tested and who not.

As to the LifeClock, it is really but a crude commercial gimmick. Epidemiologically oriented physicians can, if asked, provide patients with far more accurate predictions of future life span; and, in contrast to a mechanical clock, these physicians can then modify their predictions as new tests—and new therapies—arise.

Stanley M. Aronson, MD

The Spirillas

Coil-shaped, vermiform micro-organisms, called spirillas, had been repeatedly observed by 18th century microscopists; but the first earnest account of their morphology, locomotion and place within the kingdom of the living appeared in an 1834 paper by Ehrenberg. He believed that these organisms were probably protozoan; he proceeded, then, to contruct a new genus name for them, the *Spirochaeta* (Greek, *speira* meaning coil; *chaite* meaning hair.) Ehrenberg had directed his investigations both to the abundant numbers of free-living spirillar saprophytes flourishing in stagnant waters as well as to the commensal spirochetes of certain shellfish. As they busily catalogued this wondrous diversity of nature, the naturalists gave no thought to a more sinister role for the spirochete.

The spirochetes lingered quietly within the domain of the zoologist until 1872 when the German pathologist Obermeier accused these organisms of causing a febrile epidemic disorder called, variously, relapsing or famine fever. This disease, known since antiquity, was initially believed to be some variant of typhus; it certainly arose under conditions known to favor the emergence of typhus, selectively affecting the malnourished who were living under stressful, crowded and nonhygienic circumstances. In the 19th century, the disease was most prevalent in Ireland, Russia and the Balkans. Obermeier had detected a filamentous spirillum in the blood of the afflicted and called it *Protomycetum recurrentis*; later, colleagues renamed it *Spirochaeta obermeieri* and still later, *Treponema recurrentis*. Further studies on its physiology, this century, have caused it to be reassigned to the *Borrelia* genus. The organism, by whatever name, requires a louse or tick vector. The disease is still widespread in parts of eastern Europe and in subSaharan Africa. Tick-borne cases of relapsing fever (locally called cabin fever) crop up rarely in the southwestern states. When louseborne, the major reservoir is man; and when tick-borne, rodents serve as the enduring reservoir. In 1975, largely through the initial speculations of two lay women from Lyme, Connecticut, a new form of tick-borne Borreliosis (Lyme disease) has been identified. In the first 9 months of 1994, 7,873 new cases of Lyme disease have been verified in the United States.

The first decade of the 20th century witnessed great scientific inquiry into the disease-creating role of the spirochete, particularly in the widespread venereal disease called syphilis. In 1903, Metchnikoff and Roux succeeded in transmitting syphilis to monkeys. In 1905 Schaudinn and Hoffman announced that a spiral organism could be recovered uniformly from the chancrous exudate and that it was therefore the likely cause of syphilis (likely, rather than definitely, because the organism could not be cultured *in vitro* and then reproduce the disease when introduced into a receptive host; thus it did not fulfill all of the postulates of Koch). This organism was difficult to stain and its discoverers chose to name it *Spirochaeta pallida*. Years later, Schaudinn renamed the genus, *Treponema* (Greek, *Trepo*, meaning to turn; and *nematos*, meaning thread) and the species, *T. pallidum*. In 1906 Karl Landsteiner introduced the darkfield mechanism as a rapid method of readily viewing the living spirochete by microscopy. Until recently, this laboratory procedure remained the standard means by which gyrating and spiralling bacteria could be firmly identified. In the same year Wasserman and associates adapted the complement-fixation procedure as a screening test for syphilis. And in 1909 Ehrlich introduced an organic arsenical called Salvarsan as a therapy for syphilis. Truly, a noteworthy decade in which the etiologic agent of syphilis was defined, the mechanism found by which this organism could be readily viewed, a serologic procedure for extensive community screening devised, and, finally, a reliable therapy offered.

Public health physicians recognize a triad of closely related (if not identical) nonvenereal treponematoses called pinta, yaws and bejel. Pinta, indisputably a New World disease, derives its name from the Spanish *mal del pinto* (sickness of the blemishes.) Pinta is a relatively mild disorder but in rural Mexico it carries, nevertheless, an inexplicable air of foreboding. This sinister aura dates from the conquistadorial age when Mexicans showing evidence of pinta (because it bore a superficial resemblance to old world leprosy) had been ordered shot by Cortez. The causative organism of pinta, *T. carateum* (*carate* was the precolumbian Indian name for this disease) cannot be distinguished morphologically from *T. pallidum*.

Yaws, transmitted in childhood by nonvenereal intimacy was, until recently, hyperendemic to the Caribbean basin. Intensive preventive measures and the widespread use of penicillin have dramatically reduced the incidence of yaws. Its causative organism, *T. pertenue* (Latin, weak), isolated first by Castellani in 1905, is indistinguishable from *T. carateum* or *T. pallidum*. Yaws is an African word meaning raspberry (serving thus to describe the exanthemous eruption of the disease which looks like mashed raspberries.) The European name for yaws, framboesia, is from the French, *framboise,* also meaning raspberry (cf. *compote de framboises, creme aux framboises*, etc.) Leviticus (13:2-44) describes a disease which some feel represents yaws. Bejel (an Arabic word) is also a nonvenereal treponematosis, sometimes called endemic syphilis, affecting children mainly, particularly those in nomadic groups resident to the Middle East and East Africa.

In 1886, Weil described an acute, febrile disorder he had seen in four males exhibiting renal, hepatic and neurologic abnormalities. As more cases accumulated, some association with sewer work became evi-

dent. In 1916, Inanda and associates, in Kyushu, Japan, found spirochetes in the urine, liver and blood of Weil's disease victims; they called the organism *Spirochaeta icterohemorrhagiciae*. Noguchi contended that the morphology of these organisms (with their distinctive terminal hooks) was sufficiently unique to justify a new genus which he called *Leptospira* (Greek, *leptos* meaning thin, delicate). He also demonstrated that the natural reservoir of the organism is the water rat and that humans acquire the infection through occupational or recreatioinal exposure to rat urine. There is but one pathogenic species in this genus (*L. interrogans*) but at least 170 separate serotypes have been demonstrated. Before Weil's inaugural paper on leptospirosis, there had been fragmentary evidence that some cases said to have been yellow fever with renal involvement were, in fact, leptospiral infections. (In one instance, the fixed tissues preserved from a 19th century New Orleans victim allegedly of yellow fever—were examined histologically a century later and leptospira were identified.) The obscure epidemic of hepatorenal sickness afflicting Napoleon's troops in Egypt (1799) may also have been leptospirosis.

Spirochetes are assigned, unambiguously, to the realm of the bacteria. They are prokaryotic, reproduce by binary fission and are capable of limited protein synthesis. As spirochetal metabolism becomes still further clarified, their nomenclature may be subject to still further change, creating thus a cottage industry of its own. At the moment, though, the spirochetes pathogenic for humans are arrayed within three genera: the *Treponemata*; the *Leptospira*; and the *Borrelia* (named in honor of the French bacteriologist, A. Borrel.) The latter two, while quite fastidious, can nevertheless be cultured *in vitro* if the medium is enriched with long-chained fatty acids. The *Treponemata*, however, still defy *in vitro* culturing. Among mollusks and other invertebrates, there are numerous additional genera, the most populated being the *Cristispira* (Latin, *crista*, a winglike extension, an allusion to the undulating membrane characteristic of this genus) containing many of the alimentary parasites of the mollusca, and *Saprospira*, which embraces many of the marine forms. The abundance of spirochetes pathogenic to invertebrates and the numbers of bloodborne spirochetal species infesting various mammalia are truly vast. What had once been an idle amusement of the 18th century biologist has evolved now into an oppressive race of pathogens threatening almost all higher forms of life.

Stanley M. Aronson, MD

The Addict from Xanadu

The meager post-mortem description reveals the following: *The decedent was a moderately corpulent, grey-haired male with no external signs of disease or injury. The pleura exhibited numerous dense adhesions, and the pleural cavities contained liters of loculated serous fluid; the ventricles were dilated and the heart was notably enlarged, particularly the muscles of the left ventricle; the aorta was sclerotic; and the liver was large and quite friable.* It sum, it was the body of a 62-year-old male who ate well, probably drank copiously and died of congestive heart failure. And had the laboratories of 1834 London also been able to analyze for opiates, high tissue concentrations undoubtedly would have been demonstrated. Nowhere in these brief, maudlin details, however, does one discover that unique talent and scintillating intelligence called Samuel Taylor Coleridge.

His life may be summarized as follows: Samuel was born in 1771, the youngest of 10 children of a West Country Anglican minister and teacher. Within the next generation, this family of modest means would produce numerous poets, chief justices, critics and church leaders. Samuel was a gifted, compulsively diligent student but his early years were marked by numerous family tragedies. His schooling was supported by competitive scholarships that carried him through secondary school and university. He then married, sired three children who lived to maturity, but he was, for most of his life, an absentee husband and father. He fitfully bestowed his companionship, rather, upon a series of very close friends including Robert Southey, Charles Lamb and William Wordsworth. Rarely, though, was he able to support his family through his personal labors, but lived instead upon the numerous bequests from his indulgent admirers, particularly the Wedgworth family. In the years following his Cambridge education, he foresook the holy orders for which he had been preparing. Instead, inflamed by the Jacobin heresies of the revolution unfolding in France, he passionately invested much of his energies in antiroyalist activism and unrealistic (as well as unfulfilled) plans to establish an agrarian utopia somewhere in the wilderness of Pennsylvania. His poetic production was limited and his subsequent life evolved into a trail of abortive poetic efforts. (Indeed, his most famous poem, *Kubla Khan, A Vision*, was still incomplete when published 19 years later.)

Coleridge was an obsessive conversationalist, who travelled widely without plans, made promises that rarely materialized, drank heavily, entered into numerous but unrequited love affairs and consumed astonishing amounts of opium. And yet, had *Kubla Khan* and *The Rime of the Ancient Mariner* never been composed, Coleridge's name would surely have survived as one of England's most gifted minds and as unrivalled critic, interpreter of Shakespeare, linguist, essayist on European politics, philosopher, analyst of dreams, newspaper columnist, early psychologist, compulsive diarist, Unitarian minister, and even experimenter in optical physics. His philosophic writings impressed many contemporary scholars, although Carlyle once described some of his speculations as "thrice refined pabulum of transcendental moonshine." On the other hand, his psychological studies, particularly in secularizing dream interpretation, were said to anticipate the writings

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of Freud.

When problems (and bills) accumulated, when his poetic voice was stilled—or at least grew fallow—Coleridge's consumption of laudanum (at six pence an ounce) increased dramatically to over a gallon per week. During such intervals he would become hypnotically entranced with a candle, staring, stupefied, into its flame for endless hours while rhapsodically describing the wonders of its spectral display. Sounds, too, would become disproportionately magnified during these opiate intervals and Coleridge then preferred rural silence to urban clamor. Texts, written by pharmacologists rather than poets, state however that opium diminishes both visual and auditory acuity (which is what one might expect of a drug that sedates and constricts the pupils).

Despite numerous attempts to rid himself of the curse of laudanum, despite his ultimate return to the Anglican faith of his father, despite the affectionate esteem by such as Carlyle, Mill and even a New Englander named Emerson, Coleridge never quite succeeded and his growing opiate addiction followed him remorselessly to his death. Pleas from his friends to "rise above the dependency" led to this written response: "You bid me rouse myself. Go bid the man paralytic in both arms, to rub them briskly together, and that will cure him." In another despairing letter Coleridge says: "I have prayed with drops of agony on my brow; trembling not only before the justice of my Maker, but even before the mercy of my Redeemer." In his terminal months he was forced to relocate to the home of his apothecary/physician, there to be nursed until his death. His 62 years of contentious life embraced the American, French and Industrial Revolutions.

To most, Coleridge remains a remote poet who authored a lengthy poetic tale describing an unnamed sailor who went to sea, killed an albatross without visible reason, saw his shipmates then die of thirst while becalmed in a windless sea ("water, water, every where, nor any drop to drink"); and finally, as a ceaseless, penitent wanderer, was condemned to relate his grim story to random strangers. ("The man hath penance done and penance more will do.") The survival of the opening lines ("An ancient mariner, he stoppeth one of three. . .") has been helped through its adoption by elderly Brooklyn Dodger fans as the fitting description of the fielding skills of their former shortstop.

To the medical profession, Coleridge represents the subject of numerous psychobiographic inquiries, while his poetry graces many texts on the psychological effects of opium. But can opium be blamed for Coleridge's failed marriage, chronic indebtedness, periodically irresponsible behavior and above all, his alleged failure to fulfill the promise of his undeniable genius? (Late in life, Coleridge would write: "By what I have effected am I to be judged by my fellow man; what I *could* have done, is a question for my own conscience.") On the other hand, may we credit opium for some of his creative genius? Might he have become but a loquacious country parson were it not for the juice of the poppy? It is hard to accept that opium, by itself, will generate brilliant thoughts, new philosophies and intuitive poetries. It may perhaps be argued that all humans possess the synaptic complexities for surpassing creativity and that opium merely sweeps away those inhibitory conventions that restrain us from bringing forth exquisite sonatas and sonnets on a daily basis. Were this so, then we should confidently expect to find our most gifted artists and writers among the population of the disenfranchised and chemically dependent; and were this to be, then drug abuse, in some quarters, might even be encouraged.

Coleridge was the archetypal pre-Victorian opium-drenched intellectual. But his wretched, brooding spirit found neither respite nor aid in his relentless captor, opium. The drug helped to assuage his depressions but distorted his perceptions, deprived him of his innate gifts and gave license to his intensely terrifying dreams. Indeed, Coleridge's greatest abhorence of opium rested in the appalling dreams it unleashed, "*of shapes and thoughts that tortur'd me! Desire with loathing strangely mixt, on wild or hateful objects fixt.*" In varying proportions, the burden of opium became Coleridge's destiny, eternity and hell.

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Idiopathic Normal Pressure Hydrocephalus: A Revisionist Interpretation

Joseph H. Friedman, MD

The syndrome consists of a progressive dementia characterized by forgetfulness, psychomotor retardation and unsteady gait. At an advanced stage akinetic mutism and severe bilateral pyramidal and extrapryramidal signs may be present.

Our perception of normal pressure hydrocephalus (NPH) has changed greatly over the past few years. It was once considered a common cause of reversible dementia but is now more correctly viewed as a rare syndrome[1,2] that is primarily a gait disorder.[2] Problems continue to plague our understanding of this syndrome:

- There are no clear diagnostic criteria;
- There are no identifiable pathologic changes other than hydrocephalus;
- Hydrocephalus occurs as an incidental finding in otherwise normal people;
- Definitive diagnosis can only be made by a beneficial response to shunting; and
- Shunting is not a low risk procedure. Yet not shunting may condemn someone to progressive dementia and incapacitation. Improvement after shunting, on the other hand, may be transient and one study reported that not intervening produced similar results to shunting.[3]

The syndrome of NPH was first described by Adams et al[4] in 1965 with the description of three cases of progressive dementia and gait dysfunction associated with multiple other neurologic features in which very large ventricles were found on pneumoencephalogram.

Two patients had no apparent explanation for the ventriculomegaly and the third had a third ventricular tumor causing obstruction of cerebrospinal fluid outflow to the fourth ventricle. Each patient improved dramatically with ventricular shunting leading the authors to conclude that a new form of reversible dementia had been identified. "The syndrome consists of a progressive dementia characterized by forgetfulness, psychomotor retardation and unsteady gait. At an advanced stage akinetic mutism and severe bilateral pyramidal and extrapyramidal signs may be present."[4]

Since then, an unknown number of patients (including the neurologist H. Houston Merritt) have been subjected to the perils of shunting in the hope of reversing a progressive dementia. It is the thesis of this paper, and the thrust of recent reports that NPH is primarily a gait abnormality and is rare.

What is NPH? How common is it?

By definition, the prerequisites for NPH are that there must be ventriculomegaly and normal intracranial pressure. How large the ventricles must be is unknown.[5] How much cortical atrophy is acceptable in the face of enlarged ventricles is also debated.[6] What type of dementia must be present[7] and how severe it must be is clearly variable[8] and what gait abnormality is associated with NPH varies from paper to paper.[4,9-11] The result therefore is chaotic since criteria for the definition of the syndrome are not universally accepted, and criteria for describing improvement and over what duration improvement must be maintained also varies.

Secondary normal pressure hydrocephalus responds well to shunting, whereas the idiopathic form, while more common, is much less likely to respond.

The first concept of importance in understanding NPH is how cerebrospinal fluid (CSF) flows. It is secreted by the choroid plexus in the ventricles and also by the brain parenchyma. It flows out of the ventricles, from the lateral ventricles to the third ventricle and then to the fourth ventricle via the Aqueduct of Silvius. From the fourth ventricle it exits via the foramen of Magendi and Luschka. The fluid flows down into the spinal canal and up over the convexities to the sagittal sinus where it is absorbed via the arachnoid granulations. Hindrance to the flow over the convexities diverts fluid back into the ventricles causing reflux, ie, CSF flowing back and forth between the ventricles and the subarachnoid space. Any toxic substance in the CSF, such as blood or products of inflammation, can cause scarring of the subarachnoid space and hence can induce ventriculomegaly. NPH can arise therefore as a secondary process, due to preceding subarachnoid hemorrhage, trauma or meningitis. Thus NPH can be subdivided into idiopathic, or primary, NPH and secondary NPH.

Secondary NPH responds well to shunting, whereas idiopathic NPH, while more common, is much less likely to respond.

In 1977, a report summarizing results of 73 shunted patients noted that, "the syndrome varies from mental changes alone to gait disturbances, alone, with most patients . . . having both features in varying proportions."[8] The authors made two critical and prescient observations: If the dementia was more severe than the gait dysfunction, patients were unlikely to improve significantly. Secondly, isotope cisternography, a test in which a radioactive tracer is injected into the CSF to follow CSF dynamics, was useless to predict either a response or a lack of response to shunting.

Since then, several studies, including some with large numbers of patients, have been reported with highly variable outcomes.[2,3,6,8,12,13] No study with significant numbers was performed prospectively, and none compared outcome of treated to untreated patients in a standard placebo-controlled trial. Many patients with the triad of symptoms do not have NPH. One retrospective study of 627 demented patients found that 8% had the triad of NPH but only 12% of these had CT evidence of NPH.[14] The most recent report[2] retrospectively evaluated 166 consecutive patients and reported that only 15% of the idiopathic NPH patients improved significantly and that mor-

ABBREVIATIONS USED
CSF: Cerebrospinal fluid
MRI: Magnetic resonance imaging
NPH: Normal pressure hydrocephalus

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bidity was sufficiently high that the risk-to-benefit ratio was only 1:1.7, making shunting a risky proposition. Furthermore, since this study involved all the neurosurgical centers in Amsterdam, Holland, every shunted patient in Amsterdam was accounted for, allowing for an estimate on the incidence of NPH to be made for the population of Amsterdam. This was 1.3 per million per year, which is about the same incidence as that of Jacob-Creutzfeldt disease. Thus in the state of Rhode Island, there should be 1–2 cases per year.

Why the conflicting data?

NPH is a clinical syndrome anchored to a single finding, ventriculomegaly. Some authors require that no cortical atrophy be allowed,[7] thus excluding consideration of hydrocephalus ex-vacuo (hydrocephalus due to brain atrophy), whereas others state that some patients improve with shunting despite atrophy.[6]

The dementia is poorly characterized.[7] Although the dementia is thought to be related to lateral ventricular enlargement causing "frontal lobe" dysfunction, no single neuropyschometric test has been found to predict shunt response. Since the third ventricle abuts the thalamus, which also is involved in language, praxis and memory functions, the enlarged third ventricle may contribute to the cognitive dysfunction as well.

. . . in the state of Rhode Island, there should be 1–2 cases per year.

The gait disorder has been described in so many different ways that, despite sophisticated observations, one is left with the illusion of description only. Adams et al[4] described the gait as "unsteady" and "difficult to categorize." Seventeen years later, Fisher,[9] a co-author of the original Adams et al paper, described a majority of patients with NPH having "imbalance . . .: poor balance, off balance, unsteady, wobbly, staggering, drunken, falling." Five of 30 patients had spells in which the legs got so weak that they had to sit down in the street. Two were blown over by the wind. Symptoms fluctuated widely in severity from day to day and week to week. In a more scientific study, Sudarski and Simon[10] measured various parameters of gait in NPH patients and noted that with progressive disease, the flexors and extensors of the leg contracted more and more simultaneously, causing a gait disorder with rigid and flexed legs. All aspects of gait were identical to those of Parkinson's disease except for the arm swing, which was relatively preserved. This study, therefore, concluded that the gait of NPH is basically one of "parkinsonism from the waist down" yet another report[11] describes a gait "apraxia" in which patients cannot walk or sit up in bed but, once seated, can kick a ball, tap a foot and do diverse coordinated maneuvers. These patients were unable to put one foot in front of the other when standing.

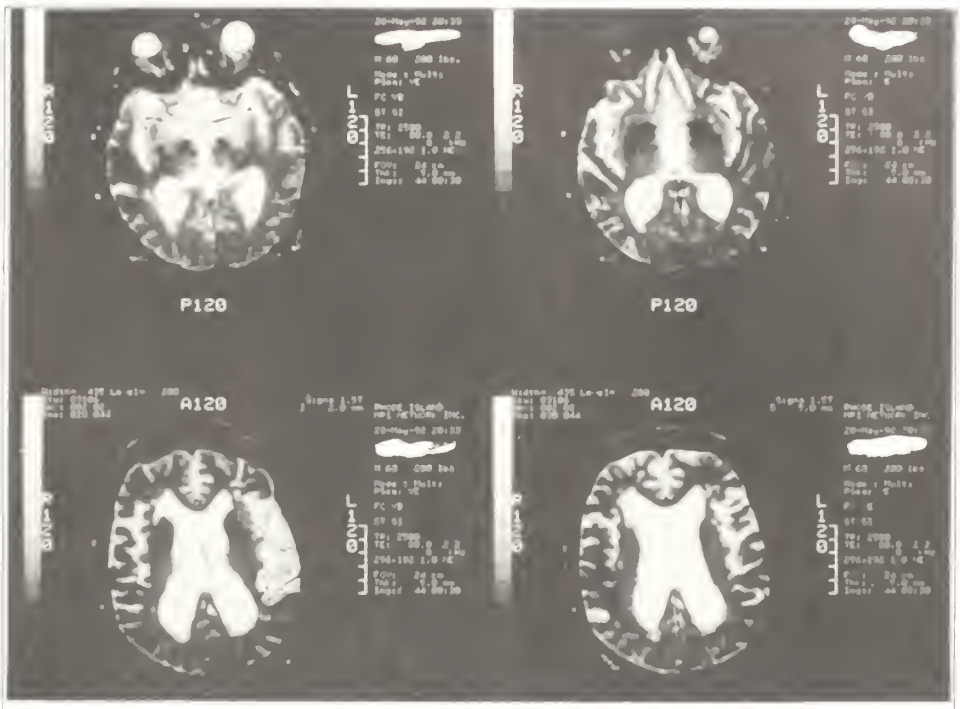

Fig 1.—MRI of patient before shunt.

Thus the dementia and the gait dysfunction of NPH are so variable that no clinical criteria can distinguish them from several other disorders. The urinary incontinence is thought to be of an "upper motor neuron" nature,[15] meaning that there is urgency and frequency leading to the loss of urine, as is seen in disorders of the upper spinal cord. This incontinence may be due to the combined effects of the "spastic" bladder which begins to contract at low volumes causing urgency and the walking dysfunction causing slowness in getting to the toilet. With advancing dementia the incontinence becomes more difficult to interpret since many demented people urinate without concern for social convention.

Case presentation:

The patient was a 68–year–old man referred for evaluation of possible Parkinson's disease. For the past 3 years he had a slowly progressive gait disorder, which he attributed to a feeling of fatigue and weakness in his legs that increased with walking. After resting he walked normally but only for a few steps, after which the problem began and increased with effort. He also noted a desire to run forward when he became tired. He denied any other symptoms of parkinsonism such as slowness, decreased dexterity, tremor, changes in penmanship, voice or balance. There also were symptoms of urinary urgency, without incontinence, and nocturia, which had never been evaluated. There was no family history of any neurologic disorder, and the patient had no history of neurologic or psychiatric dysfunction, toxin exposure, or use of dopamine blocking drugs. He had a history of gout for which he took colchicine and allopurinol and angina for which he took nifedipine.

Evaluations by previous physicians had included a spinal magnetic resonance imaging (MRI) scan showing spondylotic changes in the lumbar spine and two electromyograms one of which was normal and the other revealing mild polyradiculopathies in both legs. He scored 29 out of 30 on a mini-mental status examination 1 year prior to the current evaluation. The neurologic examination was normal except for gait, diminished amplitude on a rapid heel tapping maneuver bilaterally, slightly decreased rapid alternating movements of the left hand and absent right ankle jerk. The patient initially walked normally but after a brief period exhibited diminished arm swing on the right and then began to drag his right leg. With prolonged walking, he developed mild flexion of the knees and decreased stride bilaterally. A trial of carbidopa/levodopa produced slight improvement.

A brain MRI revealed marked dilatation of the third and lateral ventricles consistent

with normal pressure hydrocephalus. There was moderate periventricular high-intensity T_2 and scattered foci of high intensity T_2 in the centrum semi-ovale and corona radiata bilaterally (see figure).

. . . the dementia and the gait dysfunction of normal pressure hydrocephalus are so variable that no clinical criteria can distinguish them from several other disorders.

The patient had a medium pressure ventriculo-peritoneal shunt placed and described dramatic improvement as soon as he was allowed to stand. His urinary symptoms abated completely and he and his family noted that his behavior, personality and walking all returned to what they had been like 3 years previously. One year after shunting he was asymptomatic and his neurologic exam was normal. At the time of this report, 22 months after the shunt, the patient reported further improvement. He held two jobs and "felt great" as of this writing.

Case discussion

This case highlights some features of NPH and the problems associated with its diagnosis. This patient had asymmetric, exercise-induced parkinsonism. This type of gait disorder has not been previously reported, I believe. He had no dementia although his personality had become somewhat duller, and he had urinary urgency which was not bothersome enough to be elicited as a problem on the initial evaluation. Thus the patient had a gait disorder primarily, but also had decreased arm swing on one side. The urinary dysfunction in an older man can often be ascribed to prostatism, which is common. Finally, the near-miraculous recovery following shunting illustrates the plasticity of the brain and the fact that some people can respond dramatically to shunting.

Conclusion

Our understanding of idiopathic NPH is rudimentary. Although discussed a great deal in the differential diagnosis of dementia, it rarely causes it.[1] The shunting procedure is associated with a high degree of morbidity[2] and not intervening may be associated with a stable course.[3] However, shunting helps some patients and choosing not to shunt may condemn patients with idiopathic NPH to progressive disability.[4] Until diagnostic tests with high predictive value are developed the clinician must learn to temper enthusiasm with caution. A prospective study with comprehensive testing and long term follow up is needed to better understand this condition.

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Hereditary Factors in Sarcoidosis

Annie Keung and Michael A. Passero, MD

The etiology of sarcoidosis remains unknown but there has been an increasing awareness of familial and racial factors affecting the occurrence of sarcoidosis.

Sarcoidosis is a multisystem granulomatous disorder of unknown etiology most commonly affecting young and middle-aged adults. Pine pollen and infectious agents such as *Mycobacterium tuberculosis* have been suggested as causes of sarcoidosis, but these hypotheses have not been substantiated. The diagnosis of sarcoidosis is usually suspected on chest X-ray and confirmed by histologic examination. The most common sites of involvement are the lungs, eyes, skin, liver, and lymph nodes.[1]

There has been much controversy over the validity of the epidemiologic data collected from different countries. "Several epidemiologic surveys utilized mass radiographic screening for detecting cases of tuberculosis, with data on sarcoidosis resulting only as a byproduct. In such studies the abnormalities resulting from sarcoidosis may have been ascribed to tuberculosis and the prevalence rate of sarcoidosis thereby artificially reduced."[2] Screening with radiographic tests is ineffective in detecting extrapulmonary sarcoidosis. Therefore, there is an underestimation of the incidence and prevalence of the disease.[2]

Familial and racial occurrences of sarcoidosis suggest a genetic predisposition. The likelihood of familial sarcoidosis among certain racial groups such as African-Americans is higher than Caucasians.[3] Physicians have the impression that familial occurrence of sarcoidosis is rare. In this paper, we describe cases of sarcoidosis in a Rhode Island native and her sister (who lived out of state). In addition, we will review the evidence suggesting an increased familial and racial occurrence of sarcoidosis.

Case Report

A 44-year-old white female complained of bilateral painful ankle swelling and generalized arthralgias for 3 weeks. She did not improve on ibuprofen. Evaluation by a rheumatologist revealed a normal examination except for a nonspecific inflammatory arthritis of both ankles. She responded to plaquenil 200 mg twice daily. About 6 weeks after her initial presentation, she developed cough and shortness of breath. The total bilirubin was 1.7 and angiotensin converting enzyme was 112 (N 14–63). Chest X-ray showed bilateral hilar adenopathy, small nodules and a reticular pattern (Figure 1). A CT scan confirmed the nodules and paratracheal, peribronchial, and subcarinal adenopathy. Transbronchial lung biopsy showed non-caseating granulomas consistent with sarcoidosis. The patient's symptoms improved on steroid therapy, but chest X-rays did not show a clearing.

In the US, the prevalence of sarcoidosis in African-Americans is 10 to 17 times as high as in whites.

About 1 year before the above illness, the patient's older sister developed painful joints and erythema nodosum. She, too, complained of shortness of breath. A lung biopsy was consistent with sarcoidosis. Her pulmonary symptoms initially improved with steroid therapy, but recently her joint disease recurred. She is currently pain free on Indomethacin.

Discussion

The etiology of sarcoidosis remains unknown, but there has been an increasing awareness of familial and racial factors affecting the occurrence of sarcoidosis (Table 1). According to Harrington et al, in a survey of 733 sarcoidosis patients, familial sarcoidosis was more commonly detected in African-Americans (18.9%) than in Caucasians (5.7%).[3] Familial sarcoidosis has a higher frequency in monozygotic when compared to dizygotic twins.[4] In addition, the likelihood of finding familial sarcoidosis is highest in sibling pairs. Mother-offspring pairs have higher frequencies of sarcoidosis than father-offspring pairs.[5] These data strongly suggest a hereditary role in sarcoidosis.

Our patient and her sister both presented with symptoms of ankle swelling and pain, followed by pulmonary parenchymal involvement. Harrington studied phenotype comparison in eight sibling pairs. He compared staging of chest X-rays at the time of presentation, extrapulmonary organ involvement and length of steroid therapy. The presenting chest X-ray stages and extrapulmonary disease were similar among sibling pairs and demonstrated statistical significance (P=0.0017). The length of steroid treatment was not statistically similar.[3]

In addition to familial relationships, race seems to have an important role in the occurrence and prognosis of sarcoidosis. In the US, the prevalence of sarcoidosis in blacks is 10 to 17 times as high as in whites.[5] Race and presence of extrathoracic disease were major factors affecting clinical recovery. In whites, the probability of clinical recovery with no extrathoracic disease was 0.894, compared to 0.697 with extrathoracic disease. For black patients, the probability of clinical recovery with no extrathoracic disease was 0.760, compared to 0.464 with extrathoracic disease. Interestingly, other factors such as "character, extent, and profusion of initial roentgenographic opacities were identical in black and white patients and that the severity of the initial roentgenographic changes were unrelated to clinical recovery."[6] The annual incidence of sarcoidosis in two South London boroughs in 1977–78 was "19.8 per 10^5 for blacks and 16.8 per 10^5 for Asians compared with 1.5 per 10^5 for Caucasians. They [blacks] had more widespread extrathoracic disease than Caucasians (P<0.001) and were more commonly treated with corticosteriods (P<0.001)."[7] In addition, Caucasians seem to have a higher incidence of erythema nodosum, characterized by a less prominent and chronic course of the symptoms than in the black population.[7]

Desai and Simon attempted to explain differences in sarcoid racial distribution. They indicated that "[blacks] also have a more symptomatic and chronic course with a slightly higher morbidity and mortality than do whites. Israel and Washburne[8] found that the disease is less symptomatic in whites and frequently goes undiscovered. Thus, the reason for a higher incidence and prev-

ABBREVIATIONS USED
CT: Computerized tomography
HLA: Human leukocyte antigen

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Fig 1.—Chest X-ray showing massive bilateral hilar adenopathy and diffuse reticular nodular infiltration on both lungs.

alence in blacks may be because of their more prominent symptoms and the chronic course of their disease."[2] Desai and Simon also pointed out "marked variations in incidences of people from different stock who live in geographically adjacent regions is also noted, as in, Sweden and Finland. Irish immigrants in London have a very high incidence as compared to native Londoners . . . These examples indicate that race and ethnic origin, in addition to geographic location, may influence the likelihood of contracting the disease."[2]

Black females are reported to have twice the incidence and prevalence of sarcoidois than Caucasian women.[5] However, Desai and Simon questions this notion by indicating that the "reports arose from large urban hospitals, where the majority of patients seeking medical care for any illness happen to be females, especially black females."[11] "The current consensus is that women, especially black women, do not have an unusually high incidence of sarcoidosis. There have been no studies to show any hormonal influences on the pathogenesis of sarcoidosis."[2]

Attempts to discover genetic or immunological factors that could account for the increased familial and racial occurrence of sarcoidosis have not been successful. Much research has dealt with the enhanced or high surface density of the human leukocyte antigen (HLA) Class II genes (HLA-DR, DQ, and DP) on alveolar macrophages of sarcoidosis patients. In sarcoidosis there is an "accumulation of helper/inducer T-cells and macrophages at sites of disease. . ."[12] Spurzem et al demonstrated that "alveolar macrophages of both patients with sarcoidosis and normal subjects express all three Class II molecules, but there were no significant differences between sarcoid patients and normal subjects in the proportions of macrophages expressing these surface molecules. However, there was a significantly higher surface density of Class II molecules on sarcoidosis alveolar macrophages."[12] The high surface density of HLA molecules found on the surface of alveolar macrophages in sarcoidosis may be a result of the disease, but could also reflect a difference in regulation of surface expression of Class II antigens. Although no definite genetic predisposition to sarcoidosis has been identified, further work on the association of HLA-B8 and sarcoid might be fruitful.[21]

. . . we estimate that in Rhode Island between 100 and 627 Caucasians and between 38 and 240 African-Americans probably have sarcoidosis.

Physicians should be aware of the above information in evaluating sarcoidosis patients and their families. According to the latest US Census in Rhode Island there are 34,283 African-Americans in a total population of 1,003,464. Using these numbers and Sharma's prevalence data, we estimate that in Rhode Island between 100 and 627 Caucasians and between 38 and 240 African-Americans probably have sarcoidosis. Using Harrington et al's estimates for the percentages of each group that has familial sarcoidosis,[3] about 6 to 35 Caucasians and 7 to 45 African-Americans with sarcoidosis in Rhode Island could have an afflicted family member.

Although the familial occurrence of sarcoidosis is 5.7% in Caucasians and 18.9% in African-Americans,[3] the actual number of patients with familial sarcoidosis in Rhode Island is small. Because of the percentages, physicians should realize that familial sarcoidosis is not a rare phenomenon. Additional attention to evaluating family members of patients with sarcoidosis is warranted, especially in African-Americans.

Table 1.—Selected Reports of Familial Sarcoidosis.

Authors	Year	Relationship	Location
Martenstein[13]	1923	2 sisters	Germany
Robinson and Hahn[14]	1947	4 sisters and 2 brothers	Baltimore
Ito, Ogima, and Aoki[15]	1973	12 families (23 members)	Japan
Sharma et al[16]	1978	16 families (33 members)	London & Los Angeles
Turiaf-J et al[17]	1978	26 cases in 12 families	French Caribbean
Hosoda et al[18]	1980	16 siblings (9 parent-child; 2 husband-wife)	Japan
Nassif-X et al[19]	1985	22 families (16 Caucasian and 6 mixed Carribean)	France
Kronauer CM[20]	1988	4 cases from 2 families (father-son; 2 sisters)	Switzerland
Harrington et al[3]	1994	65 sibling pairs; 38 offspring pairs; 83 other relative pairs	Detroit

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Physicians Newly Licensed in RI During 1993

Nikki Deary, Milton Hamolsky, MD, and
Stanley M. Aronson, MD, MPH

Only a minority (9%) were born in Rhode Island although a substantial plurality had been educated at Brown and its teaching hospitals.

During 1993, 259 holders of medical degrees were granted licenses to practice in this state after having fulfilled all of the requirements stipulated by Rhode Island. This number represents an increase of 30.2% over the 199 medical licenses issued by Rhode Island in 1992. The following brief report will summarize some of the demographic and educational characteristics which define these 259 new colleagues. This paper represents the third in a series of periodic summaries issued by the Rhode Island Board of Medical Licensure and Discipline.[1,2]

Gender and Age—Table 1 provides the age and gender distribution of both the 1992 and 1993 cadres of newly licensed physicians in Rhode Island. The number of newly licensed women physicians in 1992 was 69, and the same number were granted licenses in 1993; the number of male physicians, however, rose in 1993. Accordingly, in the 1992 cohort, 34.8% were female, and in the 1993 cohort, 26.6% were female. Of those already licensed in 1992, 18.2% of Rhode Island's licensed physicians were women.[2]

In both 1992 and 1993, the youngest physician to be issued a Rhode Island license was 26 years. In the 1992 contingent, there were four male physicians older than 66 years; none of the 1993 cohort of physicians was older than 64 years. The newly licensed male physicians in both 1992 and 1993, on average, were somewhat older than their newly licensed female colleagues. The male physicians in this group, on average, were 9.5 years out of medical school; the female physicians, on average, were 7.3 years out of medical school.

Places of Birth—Table 2 lists the regions of birth of the 259 physicians newly licensed by Rhode Island in 1993. Close to one-fourth were born in New England. A somewhat larger percent (34.4%) were born in the middle Atlantic states. More of this state's newest practitioners were derived from New York and New Jersey than from the six combined New England states. Indeed, Rhode Island (8.9%) ranks only third behind New York (21.6%) and Massachusetts (10.4%) in contributing its native sons and daughters to the ranks of this state's physicians.

Over half of the 1993 contingent of physicians new to Rhode Island came from the northeastern coastal states and, cumulatively, 76.8% were born in the US. Asia, including nations of the Middle East, contributed 28 (11.5%) new physicians to Rhode Island in 1993. (For purposes of this compilation, Egypt, an African nation, was grouped in the Middle East category.) In general, since 1975, there has been a progressive decrease in the fraction of newly licensed physicians born overseas.

Medical Schools Attended—Table 3 summarizes the geographic distributions of the medical schools attended by three defined groups of Rhode Island physicians: Those already licensed in Rhode Island in 1992; those newly licensed in 1992; and those newly licensed in 1993. The percent of those granted their professional degrees by New England medical schools has remained within the 25%–30% range. The total fraction educated in the US/Canadian medical schools, however, has risen from 74.0% (licensed prior to 1992), to 84.3% (1992) and 80.8% (1993).

When reviewing the medical school documentation in these three groups of Rhode Island physicians, the most notable change is the recent reduction in the number of graduates of Italian medical schools. Before 1992, for example, there were 123 licensed practitioners in Rhode Island who had received their MD degree from Italian schools of medicine (88 alone from Bologna) constituting 4.5% of the 2,747 physicians actively practicing in Rhode Island. In the 1992 and 1993 cohorts of physicians, there were but six with degrees from the Italian medical schools (1.3%). The percentages of physicians receiving their degrees from Asian, Middle Eastern and Latin American medical schools have not changed dramatically in recent years (Table 3). Before 1992, 2.0% of Rhode Island's physicians received their medical degree from off-shore Caribbean schools; in 1992, this figure dropped to 1.5%; and in 1993, rose again to 1.9%.

Table 4 ranks the medical schools which have contributed the greatest number to the physician cadre of Rhode Island, as distributed in two groups: those licensed prior to 1993 and those newly licensed in 1993. Before 1993, Tufts medical school (Boston) was the most common medical alma mater in the ranks of Rhode Island physicians, followed by Brown University, Boston University and State University of New York (representing four discrete medical school campuses situated in Brooklyn, Syracuse, Stony Brook and Buffalo.) In the

Table 1.—Physicians Newly Licensed in Rhode Island During 1992 and 1993: By Age and Gender

Age Interval (years)	1992 males	1992 females	1993 males	1993 females
26–30	22	19	37	17
31–35	54	28	59	19
36–40	27	13	36	13
41–45	11	4	33	14
46–50	10	5	11	4
51–55	2	0	8	1
56–60	0	0	3	1
61–65	2	0	3	0
66+	4	0	0	0
Total	130	69	190	69
Average Age	36.5	34.2	37.3	36.3
Years since MD*	9.7	7.3	9.4	7.3

*: Average number of years since MD degree was granted.

ABBREVIATIONS USED
FLEX: Federation Licensing Examination

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Table 2.—Physicians Newly Licensed in Rhode Island During 1993: Places of Birth

Connecticut	8		
Massachusetts	27		
Maine	2		
New Hampshire	1		
Rhode Island	23		
Vermont	1		
New England, total:		62	23.9%
District of Columbia	5		
Maryland	2		
New Jersey	14		
New York	56		
Pennsylvania	12		
Middle Atlantic, total:		89	34.4%
Southern states:		16	
North central states:		9	
Midwestern states:		13	
Mountain states:		5	
Pacific states:		5	
Remaining states, total:		48	18.5%
Canada:		4	1.5%
Europe:		12	4.6%
Latin America:		11	4.2%
Middle East:		12	4.6%
Pakistan, India:		6	2.3%
Far East:		12	4.6%
Africa:		3	1.1%

Table 4.—Physicians Newly Licensed in Rhode Island During 1993: Medical Schools Most Commonly Attended

Licensed Prior to 1993	Licensed in 1993
Tufts	Brown
Brown	Tufts
Boston	State Univ NY*
State Univ NY*	Boston
Bologna	Columbia
Georgetown	Pennsylvania
Harvard	New Jersey
NY Medical	Dartmouth
Vermont	Harvard
Jefferson	Mass
Columbia	Jefferson
Yale	NY Medical

* Represents graduates of four geographically separated campuses (Brooklyn, Syracuse, Stony Brook, Buffalo.)

Table 5.—Physicians Newly Licensed in Rhode Island During 1993: Licensure Pathways (in percent)

Pathway	35 yrs or younger	36+ yrs	All
1992 Licensees			
National Boards	79.5	63.8	73.4
FLEX	18.9	33.8	24.6
Canadian	0.8	0.0	0.5
Dean's Request	0.8	0.0	0.5
1993 Licensees			
National Boards	77.8	61.7	70.7
FLEX	19.4	33.0	25.5
Canadian	0.7	0.9	0.7
Dean's Request	2.1	4.4	3.1

1993 licensure group Brown has supplanted Tufts as the leading contributor, graduating 24 (9.3%) of the 259 physicians new to Rhode Island. All 12 of the medical schools which contributed materially to the ranks of the 1993 cohort of physicians were confined to the New England and middle Atlantic states.

Licensure Pathway—Current Rhode Island law recognizes four mechanisms by which a candidate's body of medical knowledge can be demonstrated to equal or exceed certain established academic thresholds. These pathways include: (1) certification by the National Board of Medical Examiners; (2) through state-managed FLEX examinations; (3) through Canadian province examinations; and (4) by a letter from the dean of medicine of Brown University School of Medicine stating that the candidate, having met all other requirements, is essential for the educational needs of Brown's medical students. Table 5 provides the frequencies with which each of these pathways has been employed by licensure candidates in 1992 and 1993. Verified National Board certification was presented by almost three-fourths of the candidates. Certification through FLEX examination accounted for most of the remainder. Fewer than 1% of new licensees relied on Canadian certification; 2.4% of the 1992-93 licensees were awarded Rhode Island medical licenses following assertions by Brown's dean of medicine that they possessed certain unique investigative, academic or therapeutic skills not available to the state through customary channels.

Prior Licensure—The Rhode Island Board of Medical Licensure and Discipline requires candidates to indicate whether they hold active licenses in other states. No prior medical licenses were held by 29.5% of the male applicants or 43.5% of the women applicants. Male physicians, in general, held more out-of-state licenses than did their female colleagues (31.6% of newly licensed male physicians carried two or more active licenses in other states; 20.3% of female physicians held two or more active medical licenses.)

Board Certification—Records submitted by the 259 newly licensed physicians indicate that close to one-half (47.5%) have successfully achieved specialty board status at the time they applied for Rhode Island medical licensure (Table 6). This percent is deceptively low since many physicians apply for licensure while still in residency training; indeed, 110 of these 259 new licensees (42.3%) had been physicians for 5 or fewer years. When board certification is

Table 3.—Physicians Newly Licensed In Rhode Island During 1992 and 1992: Location of Attended Medical Schools

Medical School Region	Licensed Before 1992	Licensed 1992	Licensed 1993
New England	693 (25.6)*	59 (29.6)	67 (25.9)
Mid Atlantic	793 (29.3)	54 (27.1)	82 (31.7)
USA, other	463 (17.1)	52 (26.1)	50 (19.3)
Canada	54 (2.0)	3 (1.5)	10 (3.9)
Latin America	147 (5.4)	9 (4.5)	13 (5.0)
Asia	158 (5.8)	10 (5.0)	10 (3.9)
Middle East	95 (3.5)	5 (2.5)	9 (3.5)
Africa	9 (0.3)	1 (0.5)	2 (0.8)
Europe, west	242 (9.0)	3 (1.5)	11 (4.2)
Europe, east	53 (2.0)	3 (1.5)	5 (1.9)

* Number, and in parenthesis, percent.

Table 6.—Physicians Newly Licensed in Rhode Island During 1993: Board Status			
Years Since Graduation	Number	%, Boards	%, Two Boards
0–5 years	110	18.2	0.0
6–10 years	74	56.8	13.5
11–15 years	32	78.1	21.9
16–20 years	23	73.9	26.1
21+ years	20	90.0	10.0
All	**259**	**47.5**	**9.7**

equated with years since medical school graduation (Table 6) the percent rises progressively to 90%. A small fraction of this group, about 10%, have been awarded two or more board certificates (typically, an additional certificate in a subspecialty such as cardiology or pediatric neurology.)

Specialty Distribution—Table 7 summarizes the self-declared specialty distribution of these 259 physicians, reduced to five major categories: primary care, nonsurgical specialties, surgical specialties, emergency medicine, and institution-based specialties (the contents of these five categories are defined in the body of Table 7.) Emergency medicine has been considered in a separate group since it might easily be placed in a number of alternate categories. Newly licensed women physicians assign themselves to the primary care category twice as commonly as their male colleagues (58% vs 29.5%).

On the other hand, the relative paucity of women physicians in the surgical specialties continues.

Summary—The physicians newly licensed in 1993 are a well-trained cohort, typically board-certified, and in their mid-thirties. Only a minority (about 9%) were born in Rhode Island although a substantial plurality had been educated at Brown and its teaching hospitals. About one-third of these 259 physicians had never previously held medical licenses. Hence, the Rhode Island license represents their credentialled entrance into the independent practice of medicine.

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Table 7.—Physicians Newly Licensed in Rhode Island During 1993: Distribution, in percent, by Specialty, Age and Gender.								
	Male (N=190)				Female (N=69)			
	51+	36-50	26-35yrs	all	51+	36-50	26-35yrs	all
Numbers	71	83	36	190	38	23	8	69
Specialty								
Primary care[a]	40.8	22.9	22.2	29.5	63.2	43.5	75.0	58.0
Non-Surgical Specialties[b]	31.0	27.7	16.7	26.8	10.5	26.1	0.0	14.5
Surgical Specialties[c]	9.9	28.9	27.8	21.6	10.5	13.0	0.0	10.1
Emergency Medicine	8.5	2.4	5.6	5.3	2.6	4.3	12.5	4.4
Institution-Based Specialties[d]	9.9	18.1	27.8	16.8	13.2	13.0	12.5	13.0

[a] family medicine, pediatrics, obstetrics/gynecology, internal medicine without a defined subspecialty.
[b] internal medicine subspecialty, psychiatry, neurology, dermatology.
[c] surgery, orthopedics, ophthalmology, otolaryngology, urology, neurosurgery, other surgical subspecialties.
[d] pathology, radiology, physical medicine, anesthesiology.

The Relative Effects of Malpractice Liability, Cigarette Consumption, and Physician Income On State Health Care Expenditures

Bobby Jindal, MLitt

Data suggest that cigarette consumption before the mid-1960's relates well with higher health care expenditures and that recent consumption actually associates with lower expenditures. This may be due to delayed effects and/or the expensive medical care that older nonsmokers need.

As America's annual health care bill approaches $1 trillion and 35 million individuals remain without health insurance, pressure is mounting for radical reforms in the nation's health care system. Though much discussion has been devoted to issues like managed care, nationalized insurance, and other macro-level topics, few have analyzed the micro-level issues. The key to reducing overall health care expenditures is to determine which variables cause higher spending.

In articles discussing increased utilization of health care services, three variables appear most frequently. Epidemiologists frequently claim that behavioral factors, eg, cigarette consumption, and their health consequences cause increased demand for medical services.[1] Government officials often target physician income, based on the fee-for-service system, as giving doctors incentives to overutilize services.[2] Physicians often cite lawsuits as causing "defensive medicine," ie, unnecessary utilization of resources.[3] Though many studies have attempted to quantify the effects of these three variables, none has analyzed the direct relationship between cigarette consumption, physician income, and malpractice liability versus health care expenditures.

Literature Review

Several studies have successfully documented the negative health effects caused by smoking,[4,5] but fewer have approached the question of resulting health care expenditures. The studies that have been done are in wide disagreement over methodology and conclusions.[5-7]

Manning and his fellow researchers have attempted one of the most comprehensive studies addressing the monetary impact of smoking, but even their study illustrates the difficulties of quantifying the effects of smoking by estimating the costs of diseases known to be linked with smoking.[8]

Constructing control groups, with the same characteristics as smokers except for cigarette use, eliminates many potential spurious variables, but many of the variables purposefully controlled for may actually be effects of smoking. Also, estimating cigarette consumption from surveys, ignoring cigarette consumption by minors, using the consumer price index to estimate medical costs, controlling for alcohol consumption, and other such techniques weaken the validity of the findings. Manning's study offers the best estimate of the effects of cigarette consumption, but calculating the costs of the known effects of the habit mistakenly assumes a simple causal relationship between toxin and disease. However, the inadequacy of theoretical models is evidenced by the fact that none accurately predicts the number of deaths or economic costs of smoking when applied to actual data. The unknown effects of cigarettes, combined with agents that enhance or mitigate the effects of smoking, undermine Manning's approach.[8] The issues of rising physician income and malpractice liability are often cited in the popular literature as causes behind increased medical expenditures. Though Danzon makes many interesting points concerning liability in terms of frequency and severity of malpractice claims, no researcher analyzes the premiums and risks faced directly by physicians.[9] The physician's perception of liability is the most important factor when studying the effects of "defensive medicine" on health care expenditures. At best, recent studies show that American doctors are far more likely to order tests and surgical procedures than their European or Canadian counterparts facing less liability.[3,10,11] The analysis of physician income is even less satisfying and relies on comparing the difference in costs for patients in pay-per-service and managed competition systems; however, such conclusions ignore the fact that the latter reduces expenses by attracting the healthiest clients and offering fewer options.[12,13]

When analyzing the causes of increasing health care expenditures, many studies mistakenly estimate the costs of the known effects of particular variables. None measures the direct effects of cigarette consumption, malpractice liability, or physician income. One must assume as little as possible concerning the effects of the variables being studied; rather than estimating the costs of known effects, the relative monetary effects of the variables must be measured directly.

Research Methods

This study analyzes the relationship between three potentially causal variables and health care expenditures. The use of state data, rather than multi-national figures, minimizes cross-cultural factors. The use of correlation, rather than regression, prevents a determination of precise monetary effects, but captures the overall effects of each potential causal factor. The loss in precision is justified by the gain in accuracy; it is more important to measure all

ABBREVIATIONS USED
AMA: American Medical Association
HCFA: Health Care Financing Administration
HMO: Health Maintenance Organization

Bobby Jindal graduated from Brown University in 1991 with dual honors in biology and public policy. He was awarded a Rhodes Scholarship and he attended Oxford University, graduating in 1994 with the MLitt degree. He currently is associated with an international general management consulting firm, specializing in health insurance/managed care and pharmaceutical company problems.

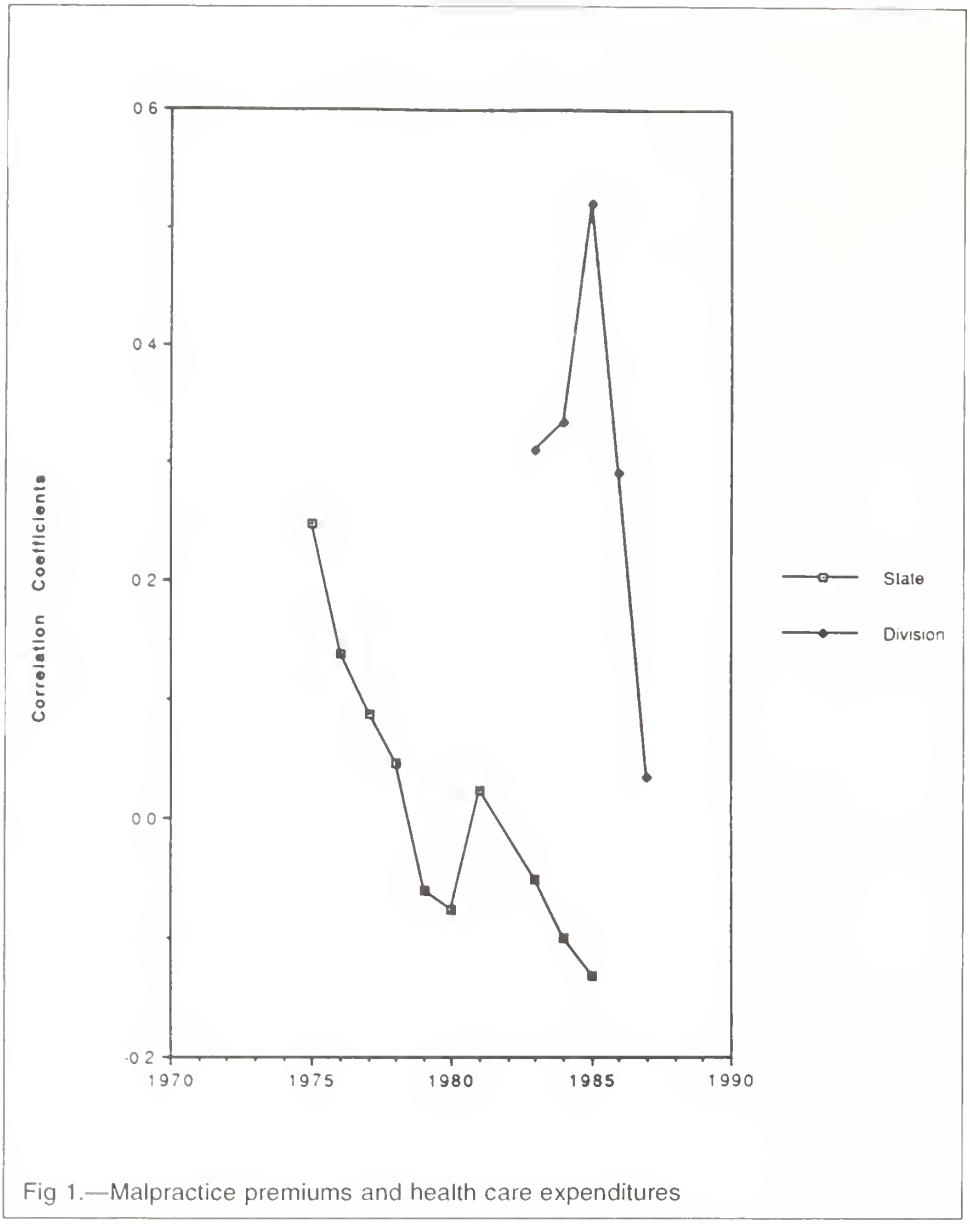

Fig 1.—Malpractice premiums and health care expenditures

effects, both expected and unexpected, rather than specifying the impact of the known effects. Each factor is evaluated in terms of direction of relationship (positive or negative coefficients), consistency of relationship (rate of change in sign or absolute value of coefficients), and relative extent of relationship (value of coefficient and alpha values).

Data

Independent variables.—Malpractice liability is measured in terms of insurance premiums, which vary with risk and extent of coverage. The state data control for amount of coverage by reflecting the premium paid by a physician maintaining constant risk; Metrica's *Comparison of Malpractice Insurance Indices* provides these figures for the years 1975 through 1985. The premiums measure risk rather than actual premiums paid, thus controlling for physicians who assume more risk and truly measuring the incentive for physicians to practice defensive medicine. At the census divisional level, the AMA's *Socioeconomic Characteristics of Medical Practice* provides actual premiums for the years 1982 through 1987. Since competition forces insurance companies to charge premiums that do not greatly exceed or equal physicians' actual risk, the two measures of liability should exhibit similar trends. Estimating per capita cigarette consumption is best done using state sales tax data. Such a calculation makes no assumptions concerning the age of purchaser, nor does it rely on self-reported data. The Tobacco Tax Council's Tax Burden on Tobacco provides the total tax collections and average state tax rate needed to calculate per capita consumption.[14] Though these estimates will underestimate actual consumption due to bootleg sales, they are the most accurate and consistent figures available.

Average annual physician income at the divisional level is available from the AMA's *Socioeconomic Characteristics of Medical Practice*. The only state data available for physician income are published every 10 years by the Census Bureau; their yearly supplements contain too small sample sizes to be reliable. Many other studies stop coding salaries after $99,999 and thus produce artificially low average incomes for physicians.

Dependent variable.—Health care expenditures are limited to those routinely defined as "personal health care expenditures." This term normally refers to actual health services and supplies and does not include research, construction, etc. Ideally, state figures for personal health care expenditures should be compiled annually by the Health Care Financing Administration (HCFA). Unfortunately, HCFA's *Health Care Financing Review* and its predecessor, the US Social Security Administration's *Social Security Bulletin Monthly*, provide adequately specific information only for the following years: 1976, 1977, 1978, and 1982.

Though annual personal health care expenditures are not available at the state level, the component of these expenditures covered by health insurance is documented. The annual *Source Book of Health Insurance Data* lists health insurance benefits for each state from 1972 through 1980.[16] These figures are multiplied by two annual ratios to convert them into actual personal health care expenditures. The first fraction is the percentage of benefits that actually covers health care and excludes disability and other indirect costs. The second fraction is the amount of total health care expenditures divided by the amount paid by health insurance companies. This translates health insurance benefits into actual expenditures and accounts for governmental, consumer, and other forms of spending. The final figure is then divided by each state's population to result in "per capita health costs."

Since health insurance data are not available at the state level after 1980, the state and local governmental component of health care expenditures, listed in the Bureau of the Census's *Government Finances*, is then used to calculate per capita health costs. For 1981 through 1987, the amount of money spent by each state government and its cities is multiplied by two conversion factors. The first is the annual ratio of total governmental spending to state and local spending. This translates the state spending level to total government spending. This figure is then multiplied by the annual ratio of total health care expenditures to governmental

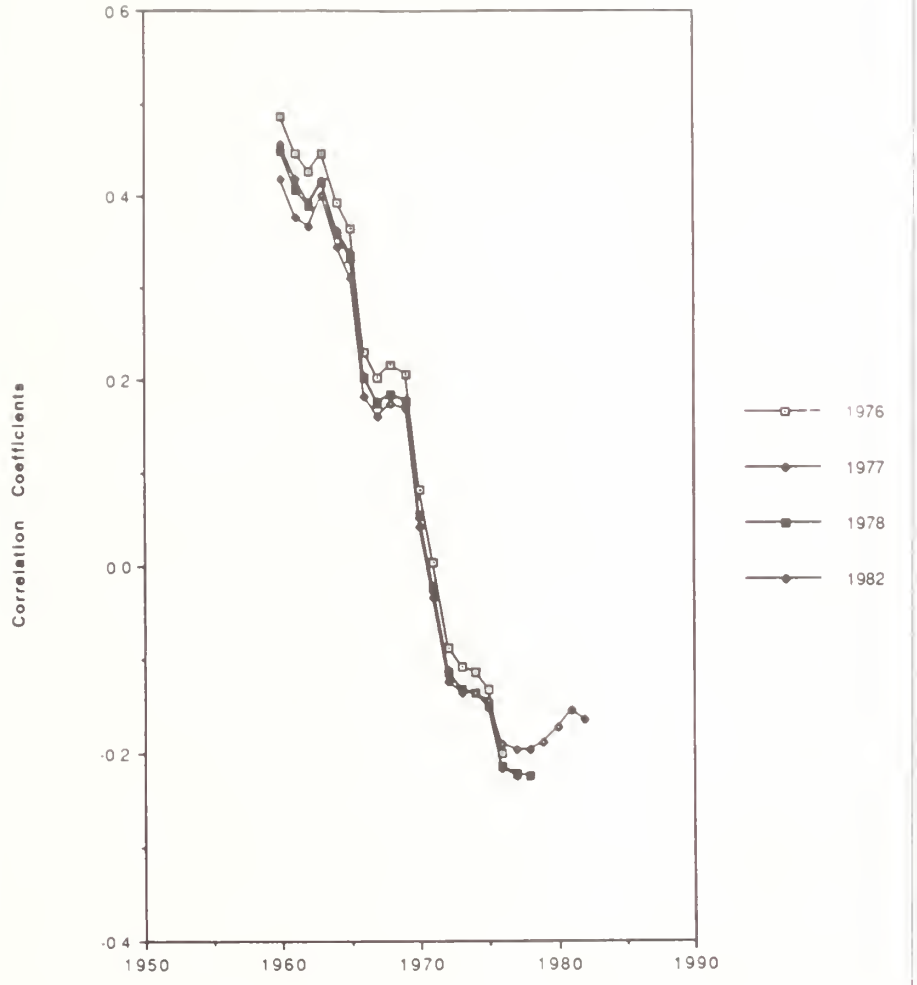

Fig 2.—Smoking and HCFA health care expenditures

spending on health care, available from HCFA documents, to result in a figure that includes all forms of spending and may be divided by each state's population to calculate per capita costs.

Methods

Longitudinal comparisons across 15 years, 1972 through 1987, and cross-sectional correlation across the 50 states and 9 regions are used to analyze changes in cigarette smoking, malpractice liability, and physician income versus changes in health care expenditures. Though liability and income are assumed to express their effects within a year, cigarette consumption is contrasted with health care expenditures for a wide range of years.

Data Analysis

Given the limitations of the data and methods used, exact dollar amounts cannot be determined from the given results. However, general trends and relative effects can be demonstrated. Correlation coefficients range from 0 to (+/-)1, indicating no correlation to perfect correlation. A value of 1 indicates that any change in the independent variable is reflected by a similar change in the dependent variable, a value of 0 indicates that the two variables change irrespective of each other, and a value of -1 indicates that any change in the independent variable is reflected by a similar change of the opposite sign in the dependent variable. Correlation coefficients measure the relative codependence of two continuous variables.

Malpractice Liability.—Figure 1 illustrates the relationship between malpractice premiums and health care expenditures. The state data demonstrate a declining correlation between liability and health care expenditures from 1975 through 1980, until the coefficients actually become slightly negative. Thus, the tendency for states with higher premiums to have higher expenditures declines throughout the second half of the 1970s. The relationship becomes barely positive again in 1981 before declining through 1985. The last 3 years indicate a declining relationship and may suggest that higher liability is associated with lower expenditures. The divisional data demonstrates the same peak followed by a trend towards a negative relationship throughout the 1980s, but the peak occurs later and more intensely.

The peaks and change in direction observed in the state and divisional data are consistent with the cyclical nature of the "malpractice phenomenon." The positive relationship evidenced by the state data during the mid-1970s describes the drastic malpractice crisis that occurred when skyrocketing premiums first attracted attention. Physicians, accustomed to low and consistent premiums, threatened to stop working when faced with high premiums, and hospitals in certain areas could not even obtain coverage. Therefore, higher risks of lawsuit settlements may have motivated already tense physicians to order additional tests and services to protect themselves. However, insurance companies gradually slowed the increase in premiums, physicians began to accept premiums as a business cost, and many hospitals began insuring themselves. The declining relationship between liability and expenditures from 1975 through 1980 may be explained by the temporary resolution of the malpractice crisis.

The sudden, but small, peak in 1981 is due to the fact that premiums increased extremely rapidly that year, even declining slightly in 1982 before resuming their upward trend. Anything from President Reagan's program of general deregulation to the emerging prominence of HMOs may have been the cause of the sudden change. The unusually high premiums, an anomaly, were not associated with any unusual change in health care expenditures; thus, no relationship between the two variables, ie, a correlation of 0, is demonstrated. After 1981, the relationship, which becomes increasingly negative, is not strong enough to indicate that states with higher liability costs have lower health care expenditures. However, if future data demonstrate a continuation in the negative trend, "defensive medicine" may be paying for itself by preventing higher expenditures caused by complications resulting from negligence. For now, it may be concluded that increased liability is associated with additional expenditures only during periods of crisis.

The relationship between divisional premiums and expenditures nicely mirrors the trends demonstrated by state data, especially the peaks and change in direction, but peaks later and more intensely. This subtle difference between the two relationships is due to the independent variables being measured; while state premiums represent risk, divisional premiums represent the actual amounts paid by physicians for coverage. Because premiums are calculated by insurance companies to approximate risk, a rise in premiums would be expected to lag behind a sudden rise in risk; thus, the divisional data demonstrate a later peak. The higher peak is probably due to the simple fact that higher insurance premiums inflate a state's health care expenditures; actual liability would not fully capture this phenomenon since many physicians assume more risk rather than paying higher premiums.[15] Contrary to popular belief, higher malpractice premiums are not associated with higher health care expenditures. Indeed, the data suggest that liability is either not related or is negatively related to health care expenditures. However, another malpractice crisis, possibly caused by unusually high inflation in malpractice premiums as seen in 1981 in state data and 1985 in divisional data, may cause both risk of lawsuit settlements and actual premiums to be associated with higher health care expenditures once again.

...recent studies show that American doctors are far more likely to order tests and surgical procedures than their European or Canadian counterparts facing less liability.

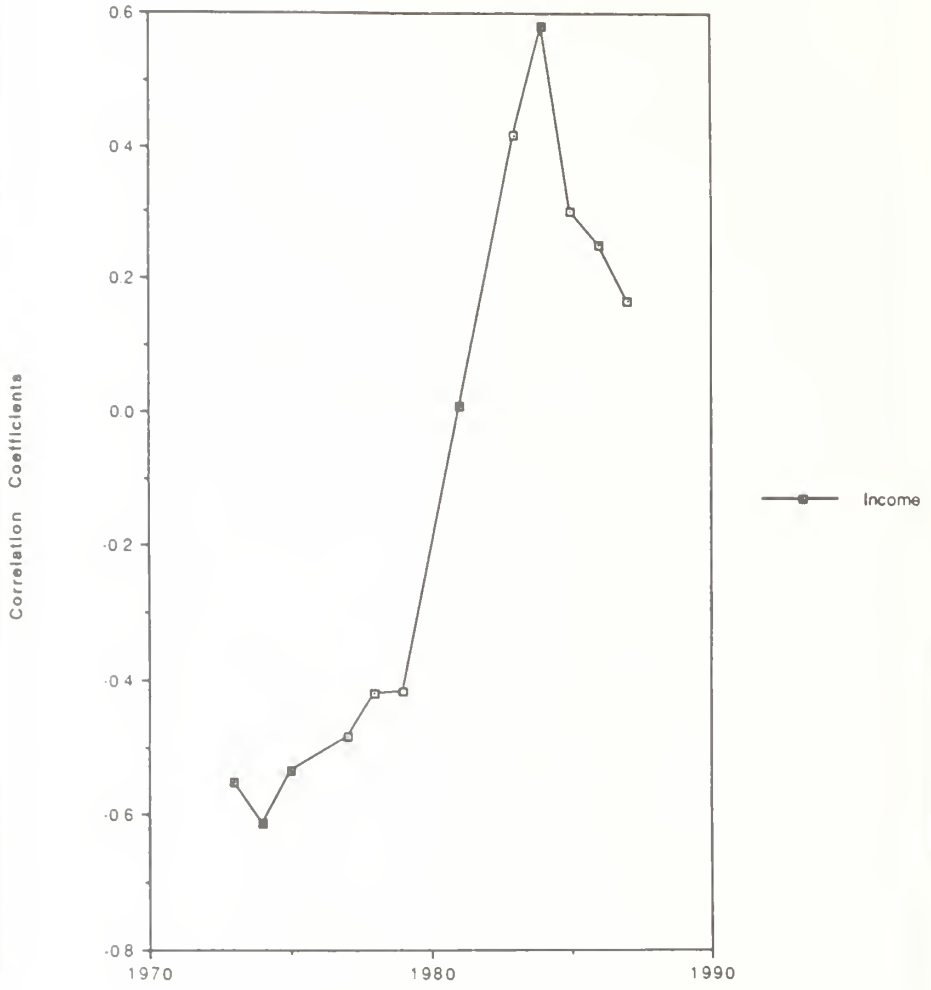

Fig 3.—Physician income and health care expenditures

Cigarette Consumption.—Cigarette consumption from the years 1960 through 1987 are correlated with health care expenditures from the years 1972 through 1987. Thus, the cigarette consumption in 1960 may be compared with health care expenditures from any year between 1972 and 1987. This wide time span allows trends to be observed between cigarette consumption and expenditures that follow by anywhere between 1 and 27 years. Due to the overwhelming number of coefficients and information generated, it is useful to analyze general trends and certain representative years.

Figure 2 illustrates the relationship between cigarette consumption between 1960 and 1982 and health care expenditures from the years 1976, 1977, 1978, and 1982. The year of cigarette consumption is on the horizontal axis and each line represents a different year of health care expenditures.

Two important features of this graph are the similarity between the 4 years of health care expenditures and the decline in the association of cigarette consumption with higher health care expenditures after consumption in the 1950s. The similarity is easily explained by noting the brief span of health care data being studied; smoking rates from any given year should relate with health care expenditures across 6 different years in similar patterns. The decline in the relationship between cigarette consumption and health care expenditures may be attributed to four reasons.

First, filters were introduced in the late 1960s and may reduce or delay the health effects of cigarette smoking. Thus, cigarette consumption starting in the latter 1960s should not relate as strongly with higher expenditures as previous smoking. A second and related theory is that smokers have yet to feel the full impact of cigarettes consumed during the 1960s and later. This theory would expect future health care expenditures to relate positively with cigarette consumption during the late 1960s, 1970s, and 1980s. Third, recent medical technology may make it more expensive to care for the older nonsmoker.[16] Since smokers tend to die prematurely, they avoid many of the expensive medical treatments incurred throughout the aging process. This may even explain the negative relationship between smoking and health care expenditures; smokers might actually save the health care system money by dying earlier. To explain the change from a positive to a negative relationship between smoking and expenditures, the third theory must be combined with a fourth related explanation that the reduced incidence of smoking decreases the number of "casual smokers," causing a concentration of disease among fewer people. The result is that overall expendi-

tures decline due to increased mortality, which is less costly, and decreased morbidity rates. The data suggest that smoking before the mid-1960s relates well with higher health care expenditures and that recent consumption may actually relate with lower expenditures. The negative relationship may actually reflect the costs of caring for elderly nonsmokers or the efficacy of filters in delaying or minimizing disease. The data do not support the claim that recent cigarette consumption correlates with higher expenditures.

. . . the data suggest that liability is either not related or is negatively related to health care expenditures.

Physician Income.—Figure 3 demonstrates the relationship between physician income and health care expenditures. The relationship between income and expenditures changes from a negative one in the mid and late 1970s to a positive one in the early 1980s, before declining to a lower positive level in the late 1980s.

Higher physician income is associated with lower health care expenditures throughout the 1970s and higher expenditures throughout the 1980s. After rising steadily from 1974, the relationship peaks in 1984 and declines. It is interesting to note that the census division with the lowest per capita health care expenditures in 1975 has the highest average physician income, and the division with the lowest expenditures in 1985 has the lowest physician income. This fact symbolizes the dramatic change in the relationship between physician income and health care expenditures.

The negative relationship between physician income and health expenditures can be explained by the fact that physicians had more control during the 1970s over the practice of medicine. Physicians receiving less compensation utilized more resource-intensive services to augment their income. This explanation of health care as a supply-driven good is consistent with the theory that physicians fearful of liability cause higher expenditures by ordering additional procedures. Indeed, Danzon briefly discusses the possibility of high premiums coupled with relatively low incomes causing unrest among physicians, who must dedicate a larger percentage of their income to malpractice insurance.[9] This may have occurred during the "malpractice crisis" of the 1970s and may have resulted in high utilization of health care services and resulting expenditures, especially in states with high premiums and low incomes.

The positive relationship in the 1980s is a result of the federal government encouraging many services to be moved from the hospital into outpatient clinics, often owned by physicians, and also regulating hospital fees during the early 1980s. Standardization of hospital fees meant that differences in state health care expenditures reflected differences in physician fees. Physicians profited from the increased number of outpatient services and were also the largest cause of relatively unregulated expenditures. States which were successful in controlling physician fees had lower overall health care expenditures and lower physician incomes; states with fewer regulations had higher physician incomes and higher resulting expenditures. As time progresses, more states are regulating expenditures caused by physicians, especially those related to outpatient clinics;[2] thus, physicians and their incomes have less influence on health care expenditures, and the positive relationship between physician income and health care expenditures is declining.

Though it is true that high incomes used to be related with lower expenditures, the mid-1980s saw this relationship change direction. However, the strength of the relationship has declined in recent years, and future figures may demonstrate another change in direction or a lack of relationship between income and expenditures.

Conclusion

Higher malpractice premiums are not generally associated with higher health care expenditures, but isolated incidences of "malpractice crisis," defined as large sudden increases in premiums, do link higher premiums with higher expenditures. This is especially true when physician income declines as premiums increase, thus making doctors even more sensitive than usual to such changes. Perhaps in an attempt to protect income, doctors order more procedures and thus increase overall health care expenditures. Data suggest that cigarette consumption before the mid-1960s relates well with higher health care expenditures and that recent consumption actually associates with lower expenditures. This may be due to delayed effects and/or the expensive medical care that older nonsmokers need. Supported by data from state government spending, insurance payments, and HCFA figures, this study demonstrates a relationship between physician income and health care expenditures that changed from negative in the 1970s to positive in the 1980s. Though the relationship declines towards the end of the 1980s, the assertion that high physician income is associated with high health care expenditures is supported.

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HEALTH BY NUMBERS

Rhode Island
Department of Health
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Edited by Jay S. Buechner, PhD
Chief, Office of Health Statistics

Mortality and Years of Productive Life Lost

In 1991, there were 9,391 deaths among Rhode Island residents, with a crude mortality rate (unadjusted for age distribution) of 935.9 deaths per 100,000 population. This rate is 8.8% higher than the corresponding rate for the United States, 860.3 deaths per 100,000 residents. However, the components of the Rhode Island rate by cause of death differ substantially from the components of the national rate (Table 1). Rhode Islanders experience higher death rates for most chronic diseases and diseases related to aging, such as heart disease, cancer, and stroke, and lower rates for injuries, including unintentional injuries (accidents), suicide, and homicide. These differences cause the age distributions of mortality to differ in the two areas.

Among Rhode Island residents in 1991 there were 2,085 deaths among persons under age 65, representing 22% of all deaths. Nationally, the percentage was higher, at 28%. A measure of the mortality burden falling on relatively young persons is the years of productive life lost (YPLL) due to mortality in a population. YPLL is calculated as the difference between age at death and age 65, summed over all deaths before age 65. It is converted to a rate by dividing by the population under age 65. In 1991, the rate of YPLL in Rhode Island was 3,851 per 100,000 population, nearly 31% lower than the United States rate of 5,556 in that year. These figures contrast sharply with the relative crude mortality rates in the two areas.

The YPLL rates by cause of death in the two areas often differ substantially, with Rhode Island having lower rates in every cause ranking in the top five for the two areas (Figure 1). (HIV infection ranks fifth in Rhode Island and sixth in the nation; homicide ranks fifth in the nation and eighth in Rhode Island.) The largest observed difference is in unintentional injuries, for which the state's YPLL rate is less than half the nation's. The rates for homicide follow a similar pattern. Even for the major chronic diseases, Rhode Island's YPLL rates are relatively low.

Table 1.—Deaths per 100,000 Population, by Cause of Death (Ten Leading Causes), Rhode Island and United States, 1991

	Rhode Island		United States	
Cause of Death	Rate	Rank	Rate	Rank
Heart Disease	321.1	1	285.9	1
Malignant Neoplasms	236.9	2	204.1	2
Cerebrovascular Disease	58.4	3	56.9	3
Pneumonia and Influenza	35.1	4	30.9	6
Chronic Obstructive Pulmonary Disease	31.5	5	35.9	4
Unintentional Injury	26.6	6	35.4	5
Diabetes Mellitus	21.8	7	19.4	7
Septicemia	12.7	8	7.8	13
Nephritis, Nephrotic Syndrome, and Nephrosis	12.0	9	8.5	12
Chronic Liver Disease and Cirrhosis	11.4	10	10.1	11
Suicide	8.9	11	12.2	8
HIV Infection	7.9	13	11.7	9
Homicide and Legal Intervention	4.4	16	10.5	10
All Causes	**935.9**	—	**860.3**	—

Over time, mortality rates have been falling, and this decline is observed in YPLL rates as well. From 1989 to 1991, the crude mortality rate fell by 2.2% in Rhode Island and by 0.7% in the United States. During the same period, YPLL rates fell approximately twice as fast, by 4.1% in Rhode Island and by 2.2% nationally. Thus, mortality declines are concentrated among younger persons in both areas. Among major causes of premature death, Rhode Islanders have experienced the largest relative declines from 1989 to 1991 in deaths due to unintentional injuries (YPLL down 33%) and perinatal conditions (YPLL down 23%) (Figure 2). Only in deaths due to HIV infection has the YPLL rate increased, and there the increase has been substantial (46%).

As measured by YPLL rates, mortality patterns among relatively young persons in Rhode Island are favorable in relation to the national experience and appear to be improving over time. The rate of improvement appears to be highest in those areas where prevention programs can have immediate impact, such as in injury prevention and in maternal and child health, and the changes may reflect the success of recently implemented public health interventions. Whatever the cause of the observed trends, the patterns of mortality reflected by this measure contrasts sharply with those seen when measuring overall mortality in the state.

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Errata

The August 1994 *Health by Numbers* on Work, Mobility, and Self-Care Disability in Rhode Island was submitted by the Disabilities Prevention Program, Susan Feeley, MPH, epidemiologist, and David Hamel, MPA, project manager.

Submitted by the Office of Health Statistics, Jay S. Buechner, PhD, chief. Health by Numbers *is edited by Jay S. Buechner, PhD, and William J. Waters, Jr., PhD*

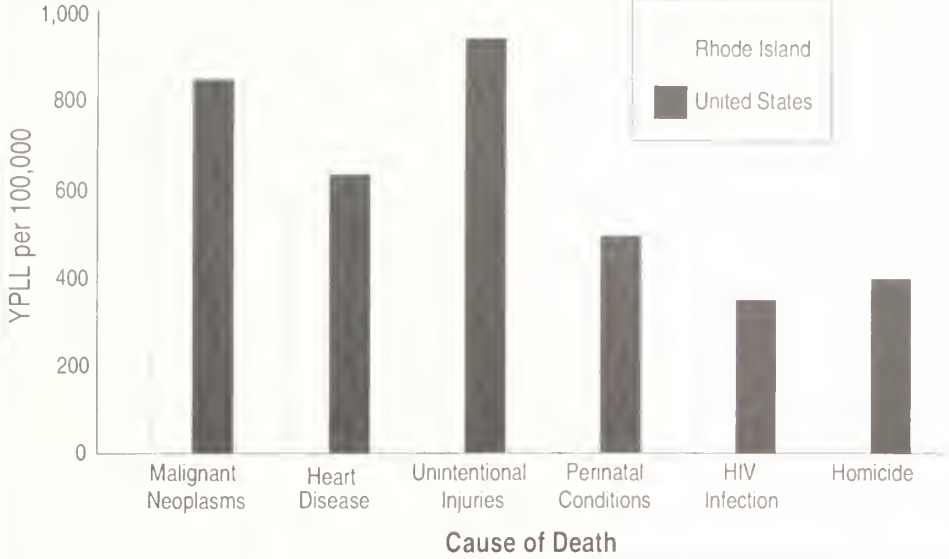

Fig 1.—Years of Potential Life Lost before Age 65 per 100,000 Population Ages 0–65, by Major Causes of Death, Rhode Island and United States, 1991

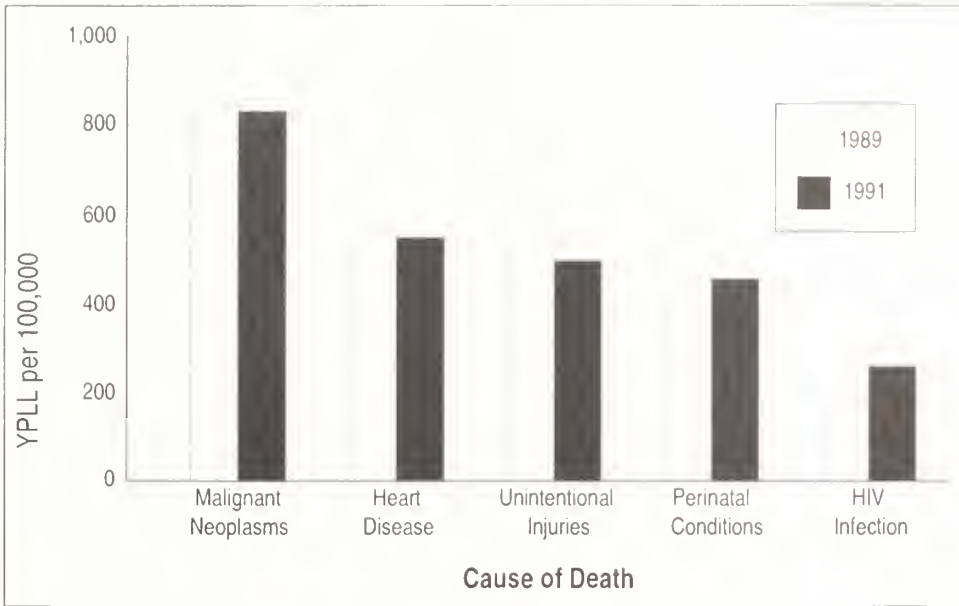

Fig 2.—Years of Potential Life Lost before Age 65 per 100,000 Population Ages 0–65, by Major Causes of Death, Rhode Island, 1989 and 1991

Rhode Island MEDICINE

Necrology 1994

Cyril J. Bellavance, MD

Cyril J. Bellavance, MD, 74, of Timberland Drive, Lincoln, an orthopedic surgeon, died April 21, 1994 at home. He was the husband of Corinne J. (Murphy) Bellavance. Born in Providence, a son of the late Cyril J. and Mary (McGuirl) Bellavance, he moved to Lincoln 21 years ago.

Dr Bellavance was a 1943 graduate of Pennsylvania State College with a bachelor of science degree. He earned his medical degree from the University of Pennsylvania in 1947.

He began his medical career with an internship at Rhode Island Hospital from 1947 to 1951, where he completed his orthopedic surgical residency. He also attended Harvard Medical School, the Bone & Joint Hospital, New York, and the Henry Jaffee Newington Children's Hospital until 1954 when he completed his pediatric orthopedic residency.

Dr Bellavance was affiliated with the Rhode Island Hospital Department of Orthopedics for 40 years. He was also associated with the Roger Williams Medical Center for 38 years, and was its staff orthopedic surgeon emeritus. He had also practiced at Memorial Hospital, Pawtucket for 18 years, and was chief of orthopedic surgery at Newport Hospital from 1960 to 1970.

He had been a member of the Brown University faculty, and clinical instructor in the department of orthopedic surgery. He was a member of the American Academy of Orthopedic Surgery, the American Academy of Cerebral Palsy, the International College of Surgeons, the Newington Children's Hospital Alumni Association, a certified fellow of the American College of Surgery, a member of the New England Orthopedics Society, the Pan-American Medical Association, and the Brown University Faculty Club.

Dr Bellavance was certified by the American Board of Orthopedic Surgeons. He was a US Air Force veteran of the Korean War, and served as chief of orthopedics at the Amarillo Air Force Base, Amarillo, Texas, from 1951 to 1954.

Besides his wife he leaves a son, Cyril J. Bellavance III of Lincoln; three daughters, Michelle A. Bellavance of Atlanta, Ga, Denise L. Bellavance of West Harrison, NY, and Leslie M. Bellavance of Milwaukee, Wis; two sisters, Louise Fogarty of Wakefield, Dorothy Sarni of Pittsburgh, Pa., and a granddaughter.

Eufrocino N. Beltran, MD

Eufrocino N. Beltran, MD, 63, of Wood Street, Swansea, Mass, a psychiatrist in private practice in the Providence area for 31 years, and associate professor of psychiatry at Brown University, died Nov. 11, 1994, at St Joseph Hospital, North Providence. He was the husband of Grace Ann (Hodgkinson) Beltran.

Born in Palompon, Leyte, the Philippines, a son of the late Elino A. and Rafaela (Nunez) Beltran, he lived in Warwick 13 years before moving to Swansea 18 years ago.

Dr Beltran was associate medical director of the psychiatric unit of St Joseph Hospital from 1987 until last January. He was a 1956 graduate of Manila Central University Medical School. In 1957 he interned at the former Union Hospital in Fall River, now Charlton Memorial Hospital. He served his psychiatric residency at the Foxboro and Worcester State Hospitals, and in 1962 opened his private practice in Providence.

He was past president of the Butler Hospital Staff Association and the Rhode Island Philippine Medical Society. He was a member of the American Psychiatric Association and the Rhode Island Psychiatric Society. He was an avid golfer and a member of the Crestwood Country Club in Rehoboth.

Besides his wife he leaves a daughter, Nancy A. Avile of East Providence; a son, Peter H. Beltran of Maynard, Mass; four brothers, Dr Eufemio N. Beltran of Chicago, Pedro N., Saturnino N. and Martin N. Beltran, all in the Philippines; three sisters, Angelita B. Baguio of Orlando, Fla, Dominga B. Viacrucis and Pomposa B. Omega, both in the Philippines, and two grandchildren.

Paul A. Botelho, MD

Paul A. Botelho, MD, 69, of 2 Lake Drive, North Providence, a founder of the Bristol County Medical Center, Hope Street, Bristol, died Jan. 30, 1994, at home. He was the husband of Claire (Capaldi) Botelho.

Born in Pico DaPadre, St Michael, the Azores, a son of the late Francisco E. and Irondina A. (Couto) Botelho, he came to this country in 1952, and lived and practiced in Bristol before retiring in 1990.

Dr Botelho received his medical degree with high honors from the University of Lisbon. His internship and residency were at Roger Williams Hospital in the early 1950s. He also had residencies at the former Charles V. Chapin Hospital and Rhode Island Hospital. He was on the staffs of Roger Williams Hospital and Rhode Island Hospital.

He was assistant clinical professor at Brown University School of Medicine. He was a member of the Bristol County Medical Society, the Rhode Island Medical Society, the American Medical Association, the American College of Physicians, the American Society of International Medicine, and the American Heart Association.

Besides his wife he leaves two daughters, Mary Ann Botelho and Alison Botelho; two stepsons, Glen, and Paul Sciotti; a stepdaughter, Gail Boyce; two brothers, Geraldino Botelho of Bristol and Humberto Botelho of Pico DaPadra; a sister, Gabriela Botelho of Bristol, and three grandchildren. He was brother of the late Maria Odette Botelho.

John T. Cunningham

John T. Cunningham, 64, of Cedar Pond Drive, Warwick, associate director of the Rhode Island Department of Health for 19 years before retiring in 1989, died May 30, 1994 at home. He was the husband of Nancy J. (Reidy) Cunningham.

Born in New Britain, Conn, a son of the late John P. and Margaret (Lehan) Cunningham, he lived in Exeter and Cranston before moving to Warwick in 1990.

Mr Cunningham was previously production manager of the Hartford, Conn, Electric Steel Corp. for several years, and later assistant superintendent of the Dr Joseph H. Ladd School, Exeter, for 12 years.

He was a 1954 graduate of the University of Rhode Island, where he also received his master of arts degree in 1964. He was a member of the Phi Kappa Phi Honor Society, and the AFSCME. He served in the Army for several years before retiring with the rank of master sergeant.

Besides his wife he leaves three sons, Stephen M. Cunningham of Greenwich, Conn, Timothy E. Cunningham of Dedham, Mass, and David J. Cunningham of West Warwick; two daughters, Ellen M. Burke,

and Karen R. Dully, both of Warwick; a brother, William Cunningham of Roebling, NJ; a sister, Evelyn Grist of Nokesville, Va, and seven grandchildren.

Helen M. De Jong

Helen M. De Jong, 83, of Monticello, Fla, head librarian for the Rhode Island Medical Society Library for several years before retiring, died March 27, 1994, at the Archbold Memorial Hospital, Thomasville, Ga. She was the widow of the writer David Cornell De Jong, author of *Benefit Street* and other works.

Born in Greenville, a daughter of the late Caleb and Mary (Medbury) Moffitt, she lived in Providence, before moving to Monticello in 1976.

She held a special interest in Rhode Island medical history and the artifacts and literature of medicine and the life sciences.

Mrs. De Jong was a Phi Beta Kappa graduate of the former Pembroke College, now Brown University, in 1932. She was a volunteer librarian at Aucilla Christian Academy, Jefferson County, Fla. She was an honorary member of the Rhode Island Medical Society, and a founding member of the Association of Rhode Island Health Sciences Librarians. She was a member of the Jefferson County Historical Society, and the Monticello Opera House. She was a member of Christ Episcopal Church, Monticello.

She leaves a sister, Angelina Glenn, and a niece, Mary Hartsfield, both of Monticello.

Jacob Felderman, MD

Jacob Felderman, MD, 84, of 236 Gallatin St., Providence, a physician at the Veterans Administration Medical Center for many years before retiring, died May 31, 1994, at Rhode Island Hospital. A lifelong Providence resident, he was a son of the late Mr and Mrs Felderman Dr Felderman was a 1931 Brown University, and received his medical degree in 1935 from the Boston University School of Medicine. During World War II, he was a captain in the Army Medical Corps.

He leaves four nephews, Albert Arbitman of Cranston, William Arbitman of Scottsdale, Ariz, Arthur Felderman of Los Angeles, Calif, and Robert Felderman in New Jersey.

Vera J. Fish, MD

Vera J. Fish, MD, 83, of 500 Angell St., Providence, a psychiatrist on the staff of Rhode Island Hospital for many years before retiring in 1979, died Wednesday at home. She was the widow of Dr David J. Fish.

Born in Toronto, Canada, she was a daughter of the late Oscar and Ida (Solvay) Weinstein. She lived in Providence for 55 years.

Dr Fish was one of nine women to graduate with a degree in medicine from the University of Toronto in 1934. She did her psychiatric residency in Santa Barbara, Calif. In the late 1930s she moved to Rhode Island and was in a private practice for more than 35 years while also serving on the staff at Rhode Island Hospital.

In 1981 Dr Fish was founder and a benefactor of the Rhode Island Medical Women's Association, which recognized her in 1988 as an inspiration and mentor to Rhode Island women physicians. She was a member of the Rhode Island Medical Society.

In 1981 she established the David J. Fish Memorial Lecture in Psychiatry at Rhode Island Hospital, in honor of her late husband who was chief of psychiatry at the hospital until his death in 1979. The lecture is now known as the David and Vera Fish Memorial Lecture.

In addition to her contributions to the medical community, Dr Fish was a strong proponent of education for people all ages. Dr Fish was a founding member of the Brown Community for Learning in Retirement in 1984, in which she remained active until becoming ill.

She leaves a son, Michael Fish of Cranston; two daughters, Mimi Alperin of New York City and Carol Scott of Providence; a sister, Elsie Pape of Toronto, and three grandchildren.

Johanna E. Mohrnheim, MD

Johanna L. (Walter) Mohrnheim, 79, of Stone Henge Road, Kingston, a psychiatrist in private practice who served as medical director at the Washington County Mental Health Center from 1968 until retiring in 1978, died May 27, 1994, at home. She was the widow of Anton F. Mohrnheim. Born in Koenigsberg, Germany, a daughter of the late Curt and Elizabeth (Weniger) Walter, she had been a resident of South County for many years.

Dr Mohrnheim received her medical degree in 1947 from the University of Hamburg, and served her internship at Good Samaritan Hospital, Dayton, Ohio, from 1951-52. She was a resident in psychiatry at the State Hospital in Howard from 1952-55. She was a resident in child psychiatry at Bradley Hospital from 1955-56. From 1964 until 1968, she was director of the day care center at the Institute for Mental Health in Howard. She was a member of the associate staff of Butler Hospital and a consultant to several other hospitals and agencies in the state.

She was a member of the World Federation for Mental Health, Washington County Medical Society, Rhode Island Medical Society, American Medical Association, American Psychiatric Association, and the New England Society for Psychiatry and Neurology. She was also a member of the Lutheran Church of the Good Shepherd, Kingston.

Joseph H. Navach, MD

Joseph H. Navach, 55, of 17240 Halsted Street, Northridge, Calif, died November 13, 1994, at home. He was the husband of Beverly (Carpenter) Navach.

Born in Providence, a son of Joseph F. and Josephine M. (DeLisi) Navach of East Providence, he lived in California for many years. He formerly lived in Barrington.

He was a graduate of Dartmouth College and received his MD from McGill University in Montreal. He served an internship at Kings County Hospital in New York, and completed his residency in orthopedic surgery at Rhode Island Hospital.

In California, he served on the staff of the Valley Presbyterian Hospital in Van Nuys. He was a diplomate of the American Board of Orthopedic Surgery, and a fellow of the American Academy of Orthopedic Surgery.

Besides his wife and parents, he leaves a son, Matthew J. Navach of San Gabriel, Calif; three daughters, Karen Mallory of Moore Park, Calif, Christine Navach of Northridge, Sharon Winkler of Chicago, Ill, and two sisters, Janet Costa of Seekonk, Mass and Joset Munro of Wickford.

Francis W. Nevitt, MD

Francis W. Nevitt, MD, 79, of Kent Drive, East Greenwich, and Venice, Fla, a surgeon for 54 years before retiring in 1986, died yesterday at St Joseph Hospital, North Providence. He was the husband of Beverly (Jansen) Nevitt, He was also the husband of the late Eleanor (Stevens) Nevitt.

Born in Raynham, Mass, a son of the late Frank O. and Sarah (Marion) Nevitt, he lived in Cranston before moving to East Greenwich 24 years ago. He was on the staff of St Joseph Hospital and Fatima Hospital, and maintained his office on Pontiac Avenue, Cranston.

Dr Nevitt was a 1936 graduate of Providence College and received his medical degree from Tufts Medical School, Boston in 1940. He interned at St Joseph Hospital from 1940-41 General Hospital, Boston. He was an Army veteran of World War II and served with the Amphibian Engineers as a Medical Corps physician. He received a Purple Heart and was the only survivor of 18 men killed by a single enemy bomb at

Anzio Beach, Italy. He also served in North Africa and was discharged from the Medical Corps as a major.

Dr Nevitt was a member of Rhode Island Medical Society and the International College of Surgeons. He was on the board of governors of Warwick Country Club and the Plum Beach Club in Saunderstown. In Florida, he was a member of the Venice Golf and Country Club and a former member of the Plantation Golf and Country Club.

Edwin B. O'Reilly, MD

Edwin B. O'Reilly, MD, 86, of Hilltop Avenue, Providence, former physician in chief at Roger Williams General Hospital, a co-founder of Student Health Services at Providence College, and who in 1978 was awarded the highest honor presented annually by the Rhode Island Division of Vocational Rehabilitation, died May 17, 1994 at St Joseph Hospital, North Providence. He was the husband of Jane A. (Kirk) O'Reilly.

Dr O'Reilly was a medical doctor-surgeon and was the chief medical consultant at the Rhode Island Department of Vocational Rehabilitation for 25 years before his retirement from his job with the division in 1987. He had retired from his private practice in 1977.

In 1978, when the division presented him with its Ben Fish Award for his work with handicapped persons, Dr O'Reilly told his audience that when he began practicing in Providence "the common treatment for pneumonia was opening the windows," and "back then, people in wheelchairs were just left. They just sat home in their chairs." The award was presented in recognition of his contribution towards bringing handicapped individuals into the mainstream of society.

Born in Providence, he was a son of the late James and Annie (McGeough) O'Reilly. He graduated in 1930 from Providence College and received his doctor of medicine and master of surgery degrees in 1935 from McGill University, Montreal.

Dr O'Reilly was an intern at St Joseph Hospital from 1935 to 1937, then joined the staff there as well as at Roger Williams General Hospital, the former Charles V. Chapin Hospital, and Our Lady of Fatima Hospital, North Providence.

At St Joseph Hospital, he operated a diabetes clinic with the late Father Hickey of Providence College and began the nuclear medicine department with the late Dr Frederick Burns. He was appointed physician in chief at St Joseph Hospital in 1955.

Dr O'Reilly was successively secretary, treasurer and president of the medical staff at St Joseph Hospital, and was a member of the executive committee of the Providence Medical Society.

He served with a host of medical organizations, including the American School Health Association, the American College Health Association, the American Geriatric Association and the American Academy of Family Physicians.

He was also a member of Mal Brown Chapter of the Providence College Alumni Association, the American Heart Association, the Rhode Island Historical Society and the RI Audubon Society.

Dr O'Reilly was the first director of Student Health Services at PC and held that position until 1985. In 1990, the college honored him for his 48 years of service by naming the new health center building after him. The college also presented him with an honorary master of arts degree in 1958 and an honorary doctor of law degree in 1965.

His many other awards included a Patriotic Civilian Service Certificate, the Army's highest civilian award, a proclamation from the master general of the Order of Dominican Fathers, Rome, in recognition of his "extraordinary service to the Dominican Order," and the Dominican Laudari Medal for exceptional service to the Dominican community. He was also admitted to the Dominican Order as an affiliate member.

Dr O'Reilly also served for 48 years as visiting physician for the Franciscan missionaries of Mary, North Providence.

Besides his wife, he leaves a daughter, Kathleen Aidala of Chepachet; a sister, Kathryn E. O'Reilly of Johnston, and three grandchildren. He was father of the late Jane O'Reilly, and brother of the late Mary V. O'Reilly, and J. Addis, J. Clifden and Harold L. O'Reilly.

John C. Osenkowski, MD

John C. Osenkowski, MD, 63, of Joyce Glen, Warwick, an internist specializing in hematology for more than 35 years, died July 21, 1994, at the Oak Hill Nursing Center, Pawtucket. He was the husband of Gloria V. (Beauchaine) Osenkowski.

Born in Coventry, a son of the late Rudolph and Julia (Dziedzic) Osenkowski, he had lived in Warwick for the past 30 years.

Dr Osenkowski was on the staff of Kent County Hospital and maintained a practice on Toll Gate Road.

He was a graduate of LaSalle Academy and Providence College. He graduated from the University of Basel Medical School, Basel Switzerland in 1958. He was a member of the Rhode Island and Kent County Medical Societies. He was member of the former Serra Club, the Warwick Rotary Club and the American Association of Retired Persons.

Besides his wife, he leaves a son, John C. Osenkowski, Jr. of Warwick and several aunts and uncles.

Bradford Portnoy, MD

Bradford Portnoy, 91, of 88 Crestwood Rd, Cranston, a physician who practiced medicine in Providence for 46 years, retiring in 1976, died July 13, 1994, at Miriam Hospital. He was the husband of Sara (Bresler) Portnoy and the late Rebecca (Tanenbaum) Portnoy.

Born in Russia, a son of the late Simon and Eva Portnoy, he came to the United States as a child and settled in New Bedford, Mass. He then lived in Providence for many years before moving to Cranston 30 years ago.

Dr Portnoy was a graduate of Tufts University and Tufts Medical School. During World War II, he was a doctor in the Army with the rank of major.

He was a member of Temple Beth-El and a member of the Rhode Island Medical Society.

Besides his wife, he leaves a son, Jacob D. Portnoy of Cranston; two daughters, Eveline Hunt of New York City and Barbara Dennis of New Bedford; a sister, Paula Portnoy of New Bedford; 9 grandchildren and a great-granddaughter. He was the brother of the late Waltham and Max Portnoy and Betty Unger.

Nicholas A. Pournaras, MD

Nicholas A. Pournaras, MD, 86, of Hawthorne Place, North Providence, died Feb. 9, 1994, at St Joseph Hospital, North Providence. He was the husband of Claire (Devaney) Lamoureux-Pournaras.

Born in Argos, Greece, he was a son of the late Angelo and Sophia (Proimopoulos) Pournaras. Since coming to this country in 1910, he lived in North Providence for 20 years and previously lived in Cranston.

Dr Pournaras was a general practitioner specializing in anesthesia for 37 years until retiring in 1983. He studied at Providence College and in 1932 graduated from Tufts University Medical School, Boston. He began practice in Providence in 1932, and in 1939 moved to Block Island to practice as its only resident physician from 1939 until 1943.

He was a Navy veteran of World War II, and held the rank of lieutenant commander. Upon his return to Providence, he resumed private practice and began work in anesthesia. He joined the Associates in Anesthesia, and practiced at St Joseph Hospital, the former Our Lady of Fatima Hospital, and Notre Dame Hospital for a total of 34 years.

In 1971, he received the Distinguished Service Award from St Joseph Hospital, and in 1984 a Certificate of Merit from the

50-year Club of the American Medical Association.

He was a member of the Greek Orthodox Annunciation Church, Cranston, served as president of the church council from 1961 to 1964, and sang in the choir for 20 years. In 1987, he was awarded the Medal of St Andrew, the highest honor that can be bestowed on a lay person by the Greek Orthodox Church, and in 1991 was awarded the Laity Award by the Diocese of Boston for his dedication to his parish.

Besides his wife he leaves a daughter, Anne Nonis of Fullerton, Calif; two stepdaughters, Kathleen Moss of Gardner, Mass, and Karen Trofi of Hermithage, Tenn; two stepsons, Roger Lamoureux of Cranston, Thomas Lamoureux of North Providence, and 11 grandchildren. He was brother of the late George Pournaras and Bessie Seymour.

Henry Thomas Randall, MD

Henry Thomas Randall, MD, 79, of Windward Lane, Bristol, surgeon in chief at Rhode Island Hospital from 1970 to 1979, and professor of medical science at Brown University from 1967 to 1979, died May 31, 1994, at Rhode Island Hospital. He was the husband of Louise (Harman) Randall.

Born in New York, a son of the late Henry Thomas and Helen (Nixon) Randall, he lived in Bristol since 1981.

Dr Randall graduated from Princeton University in 1937 and received his medical degree from Columbia University College of Physicians & Surgeons in 1941. He also earned his MedScD in 1950.

He served a surgical internship at Presbyterian Hospital, New York, until going into the Army as a medical officer in 1942. He was assigned to the 83rd Infantry Division, and was twice awarded the Bronze Star. He was discharged as a lieutenant colonel in 1945, and returned to Presbyterian Hospital and completed his residency in surgery in 1949.

Before moving to Rhode island in 1967, he served as associate director from 1956 to 1961, and vice president for clinical affairs from 1961 to 1965 at the Memorial Sloan Kettering Hospital, New York. During that period, he held several staff appointments in the New York area, including Presbyterian and Memorial Hospitals as chief of surgery.

In 1967, he joined the faculty at Brown University as professor of medical science, and was named professor-emeritus in 1979.

Stanley M. Aronson, MD, dean emeritus at Brown University School of Medicine, said, "I have known Tom Randall for over 40 years beginning both my friendship and admiration at Sloan Kettering Institute in New York. We both came to the Rhode Island community at the same time and Tom was instrumental in organizing undergraduate medical education in general surgery. He was a giant amongst those who strove to establish a medical school of excellence in this state. We will miss him deeply."

Before coming to Brown, Dr Randall served on the faculty of Cornell University Medical College for 17 years, where he was named professor of surgery in 1955.

He joined the staff of Rhode Island Hospital in 1967, as surgeon in charge, division of surgical research, in the department surgery, a post he held until 1976. He was named a consultant at the time of his retirement.

William Kreykes, president of Rhode Island Hospital, said, "Dr Henry Randall was instrumental in the development of an academic department of surgery at Rhode Island Hospital. The impact that he has made on this institution and this state in academic medicine is very significant. Long after he retired as chief of surgery, he was active in his field. He was a familiar and welcome presence at Rhode Island Hospital. We will miss him and we extend our deepest sympathies to his family."

Rhode Island Hospital officials honored Dr Randall with the establishment of the Henry Thomas Randall Distinguished Lectureship in Surgical Sciences.

Among the many honors he received during his career were the American Cancer Society National Regional Award in 1961, the Alfred P. Sloan Award for Cancer Research in 1965, the American College of Surgeons Distinguished Service Award in 1977, the W.W. Keen Distinguished Service Award, the Brown Medical Association Award in 1983, the Charles L. Hill Award, the Rhode Island Medical Society Award in 1984, and the American Cancer Society Annual National Division Award in 1985.

From 1942 to 1987, he authored or coauthored nearly 200 articles in medical and scientific journals.

His professional and community membership included the American Association for the Advancement of Science, the American Association for Cancer Research, the American Surgical Society, the Boston Surgical Society, the New England Cancer Society, the New England Surgical Society, the Providence Medical Society, the Providence Surgical Society, the Rhode Island Medical Society, and Sigma XI. He was a member and past president of the Rhode Island Division and New York City division, American Cancer Society, the Rhode Island Chapter, American College of Physicians, the Society of University Surgeons, and the Halsted Society. He was a fellow of the New York Academy of Medicine, the New York Academy of Sciences, and the American College of Surgeons.

Besides his wife, he leaves two daughters, Martha Randall Tillim of Warwick, NY, and Deborah Randall of Chevy Chase, Md; a son, Henry Thomas Randall of West Warwick, and four grandchildren.

Francis B. Sargent, MD

Francis B. Sargent, MD, formerly of Hope Road, Cranston, a founder and the first president of the League for the Hard of Hearing in Providence, which later honored him by renaming itself the Sargent Rehabilitation Center for Communications Disorders, died Dec. 31, 1994 in the Jane Brown Unit of Rhode Island Hospital. He was 101.

Dr Sargent, who specialized in the treatment of disorders of the ears, nose and throat, practiced in Rhode Island from 1923 until his retirement in 1986.

He was on the consulting staffs of Rhode Island Hospital, Miriam Hospital, St Joseph Hospital, Butler Hospital, Memorial Hospital, South County Hospital and the. former Notre Dame Hospital in Central Falls.

Dr Sargent was chief of otolaryngology at Rhode Island Hospital from 1941 to 1953, chief at Memorial Hospital from 1929 until 1968, and chief physician for the Rhode Island School for the Deaf beginning in 1924.

He served on the board of .directors of the Rhode Island Medical Society Physicians Service from 1959 to 1968. He headed the society's defense committee, which dealt with malpractice cases, for 16 years.

Dr Sargent was a member and past president of the Rhode Island Medical Society and the New England Council of Medical Societies, and was a member of the American College of Surgeons, the New England Otological Society and the Pan American Medical Society.

He belonged to the Fraternal Order of Masons, and the Simon Robinson Lodge of Lincoln, Mass., and he was a member emeritus of the Mr. Tom Club of Exeter, a conservation group founded in 1905. '

In recognition of his help for the hearing-impaired, Dr. Sargent was presented the 1979 Ben Fish Award by the Rhode Island Division of Vocational Rehabilitation. He also had received the Dr Charles Hill Award.

Dr Sargent and his wife, the late Laura H. (Smith) Bigelow Sargent, were avid bridge players; in 1959 they won the Rhode Island Open Pair Championship sponsored by the Rhode Island Bridge Club. Dr Sargent was a Bridge Life Master, and. he and his wife also played in many national tournaments.

Born in Lincoln, Mass, he was a son of

the late Charles O. and Mary (Darteaux) Sargent. He graduated cum laude from Harvard University in 1916, and from the Harvard Medical School in 1919.

After an internship at Massachusetts General Hospital in 1919-1920, he completed a 3-year residency at Massachusetts Eye and Ear Infirmary, then came to Providence on Feb. 14, 1923, to work with the late Dr Nolton Bigelow.

Dr Sargent leaves a son, Francis B. Sargent Jr. of East Providence; a stepson, Dr Nolton Bigelow of Tucson, Ariz; a stepdaughter, Meryl B. Gregory of Cranston; 9grandchildren and 7great-grandchildren.

Osama E. Sarhan, MD

Osama E. Sarhan, MD, of Country View Drive, Warwick, a physician in internal medicine in Warwick since 1977, died March 22, 1994 at his office on Greenwich Avenue. He was the husband of Nihal M. (Zaki) Sarhan.

Born in Cairo, Egypt, a son of Eldemerdash and Zeinub Sarhan of Cairo, he moved to Warwick 20 years ago.

Dr Sarhan received his medical degree from Ain Shams University, Cairo, in 1966, where he later pursued post graduate studies in general surgery and internal medicine. He interned at the University Hospital from 1967-68, and was a fellow in the departments of internal medicine and general surgery. He was in private practice in Cairo from 1968-69.

In Providence, he served from 1970-71 in the departments of internal medicine, general and orthopedic surgery at Miriam Hospital, and was a rotating intern from 1971-72. He was a house physician at Kent County Memorial Hospital from 1972-77. He was a general physician at the General Hospital, Rhode Island Medical Center, from 1972-75, and senior physician, department of medicine, since 1976.

He was a first- and second-year resident at the Lahey Clinic, Burlington, Mass, and was a member of the department of diagnostic radiology at New England Baptist Hospital, Boston, from 1975-76. In 1978, he was acting chief of medical services at the Ladd Center, North Kingstown. He was an internist at St Joseph and Kent County Memorial Hospitals since 1977.

Dr Sarhan was a member of the American. College of Radiology, the Kent County Medical Society, the Rhode Island Medical Society, the American Heart Association, the American Society of Contemporary Physicians, and the Royal Society of Medicine.

Besides his wife and parents he leaves two sons, Mohamed O. and Nabeil O. Sarhan; a daughter, Angie O. Sarhan all of Warwick; two brothers, Adel E. and Mohamed E. Sarhan, and sister, Saiwa E. Sarhan, all of Cairo.

Jacob Stone, MD

Jacob Stone, MD, 76, of Boynton Beach, Fla, died April 17, 1994, at Hospice by the Sea, Boca Raton, Fla. He was the husband of Betty Rose (Berkowitz) Stone.

Born in Providence, a son of the late Hyman and Golde (Press) Stone, he had also lived in Narragansett.

Dr Stone was a summa cum laude graduate of Classical High School, and a magna cum laude graduate of Brown University. He received his medical degree from Georgetown University, and had won the pathology prize. He served his medical internship at Grace Hospital, New Haven, Conn, and St Mary's Hospital, Waterbury, Conn. He served his residency in internal medicine at Mount Sinai Hospital, followed by a fellowship in cardiology at Goldwater Hospital, both in New York. During World War II, Dr Stone served as a captain in the Army and was recalled during the Korean War as chief of general medicine, and chief of the cardiology section at Murphy Army Hospital, Waltham, Mass.

He maintained his medical office for 30 years at 226 Waterman Street. He recently moved his office to 160 Wayland Avenue.

Dr Stone was a fellow of the American College of Physicians, and a diplomate of the American College of Cardiology. He practiced internal medicine with a specialization in cardiology for 48 years. He was on the staffs of the Rhode Island Hospital, Miriam Hospital, and Roger Williams Hospital. He taught at the Brown University School of Medicine. He was author of several papers in his field, and did original work in the development of the benchmark Master 2-Step Exercise Test, used to evaluate the cardiovascular condition of patients.

He was medical director of the Orchard View Nursing Home for 15 years. He was a member of the board of directors of the Jewish Home for the Aged, and the Jewish Federation of Rhode Island. He was a member of the Ledgemont Country Club, Seekonk, Mass, and the Hunters Run Club, Boynton Beach.

Besides his wife he leaves a daughter, Barbara Stone Halpern of Pittsburgh, Pa; two sons, Bruce Jay Stone, and Dr Kevin Robert Stone, both of San Francisco, Calif; a sister, Claire Stone Auerbach of North Dartmouth, Mass, and five granddaughters. He was brother of the late Dr Leo Stone.

Adrien G. Tetreault, MD

Adrien G. Tetreault, MD, 80, of 237 Terrace Ave., Riverside, a physician in private practice for 45 years on Central Avenue in Pawtucket from 1941 to 1986, died yesterday at the Cherry Hill Manor in Johnston. He was the husband of the late Rita (Morrison) Tetreault.

Born in Central Falls, a son of the late Isaiae Tetreault Jr. and Anna (Levesque) Tetreault, he lived in Pawtucket for 41 years before moving to East Providence in 1980.

Dr Tetreault was a 1935 graduate of Assumption College, Worcester, Mass, and received his medical degree in 1939 from the Boston University School of Medicine. He pursued graduate study at the Harvard Medical School, and the Chevalier Jackson Clinic in Philadelphia. He interned at Memorial Hospital, Pawtucket. From 1941-51 he was in family practice, and from 1952-86 he specialized in ear, nose and throat. During World War II he served in the Civil Defense Corps.

He was on the staffs of Memorial Hospital, Notre Dame Hospital in Central Falls, and Rhode Island Hospital. From 1973-84 he was a senior physician at Zambarano General Hospital. He served as school physician in Central Falls from 1941-52, and in Pawtucket from 1942-53 and 1967-86. He was appointed public health director of the City of Pawtucket in 1956 and served for 10 years. During his tenure he was instrumental in the adoption of health regulations for restaurants in Pawtucket.

Dr Tetreault set up polio clinics and mental health programs for the Pawtucket schools. He was a member of the American Medical Association, and the Rhode Island and Pawtucket Medical Societies. In 1958, he became a director of the Pawtucket Credit Union and served as secretary of its board of directors from 1980-83.

He was a former member of LeFoyer in Pawtucket, and served as president from 1955-56. He was a former member of the Narragansett Terrace Yacht Club in East Providence, serving as commodore in 1960, and was a member of the Coast Guard Auxiliary. He was a 4th-degree Knight of Columbus, Delaney Council 57 in Pawtucket. He was a former member of the Pawtucket Country Club, the To Kalon Club, and the former East Side Bridge Club. He was a communicant of St. Brendan Church in Riverside.

He leaves a son, Emile Tetreault of Pawtucket; three daughters, Diane Denelle of Wakefield, Adrienne J. Van Scyoc of Laguna Miguel, Calif, and Claudette Dixon of Pawtucket; a sister, Eva Pare; nine grandchildren and three great-grandsons. He was brother of the late Jeanne Maynard and Emile Tetreault, and grandfather of the late Daryl A. Denelle.

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THE RHODE ISLAND MEDICAL JOURNAL HERITAGE

90 Years Ago
February 1905

F.T. Rogers, MD, writing on the "Correspondence Method of Treating Disease" notes sadly, "For some years I have read these advertisements with interest, have admired the display of knowledge of the frailties of human nature exhibited by their authors and marveled that such sweeping statements regarding the nature of disease and its cure could find credence in the mind of anyone save the ignorant, and have wondered just how these fakirs proceeded to profit by their scheme which was apparently so fair and free." The author then proceeded to answer a representative few of these quack advertisements. One, a claim that falling hair and baldness can be relieved asked the reader to send a sample of his "falling hair" and, following microscopic examination, a diagnosis would be rendered (by mail) and effective therapies advised. The author promptly sent a specimen of hair from a young woman admixed with hair from a terrier dog. The diagnosis came back as progressive folliculitis and a medication prescribed for a fee of $2.50. Yet another letter, sent from a different address with yet another hair specimen, provoked the same response (and the same diagnosis). Dr Rogers responded to yet other advertisements which offered cures for dyspepsia, rheumatism, and "diseases of men." He notes: "Perhaps the most novel exponent of this method is the man who promises to make you taller by several inches by means of a specially devised instrument which changes the cartilages in the body besides several other desireable things, but the gist of the matter is ten dollars." Rogers also states: "Some of the claims are so monstrous, so palpably absurd, that it is a wonder that anyone can be found to give credence to them. I know of an instance where a patient gave a testimonial stating how she had been cured of Bright's disease who died in coma before the testimonial was printed, of a man who was cured of nephritis and albuminuric retinitis yet who was totally blind before he succumbed to the disease." Disturbing, in addition, is Rogers' observation that many licensed physicians frequently prescribe these patent medicines. "Yet I have seen on the prescription books of druggists in my city prescriptions written by educated physicians, members of state and national societies, calling for Peruna, Green's Nervura, Hood's Sarsaparilla and Scott's Emulsion."

W.A. Risk, MD, a Providence physician, writes on "The Business End of Medicine." He states: "Business is business and should always be regarded as such. We must look to our profession for support, so do not let a false delicacy or out of the place politeness interfere with your rules in money matters, or prevent you knowing where sentiment ends and business begins." The author then proceeds to outline a number of prudent measures that practitioners should adhere to, such as timely mailing of bills and a stern objectivity with those who are delinquent in payment. He adds the following thought: "The question of whether it pays to use a collector or a collecting agency is certainly a subject for discussion. Personally I have about decided that I can get as good results by persistent dunning as by paying a fee to a collecting agency." Dr Risk's paper had been presented at the Dec 5, 1904 meeting of the Providence Medical Society, the proceedings of which were also published in this issue. Note was made by some of the discussants "about the desirability of a so-called blacklist of professional Beats."

The proceedings of the Rhode Island Medical Society summarizes an adopted resolution that advocates "the establishment of a metropolitan park system since recreation grounds and open spaces promote the physical and moral welfare of the community and play an important part in preventive medicine."

The Journal publishes Dr Charles V. Chapin's regular report on mortality and morbidity in Providence. There had been slight reductions in monthly mortality rates but particularly noteworthy was the satisfactory reduction in the incidence of typhoid fever with but 38 cases and four deaths occurring in October and November.

50 Years Ago
February 1945

The lead article, contributed by William T. Green, MD, discusses diagnostic and therapeutic considerations in anterior poliomyelitis. The author notes that this disease has received considerable attention of late, both in the lay press and the professional literature. He reviews, first, the clinical manifestations particularly during the prodromal stage. Treatment regimes, including the Kenney therapies, are outlined as well as certain splinting techniques and surgical interventions.

The correction of speech and reading difficulties is outlined by Edwin M. Cole, MD, a Boston-based neurologist. The author describes various typical cases seen in a language clinic. "In some cases there are organic defects, congenital or acquired, conditioning language. In other cases, there is little native ability to master language in speech or in reading. This lack of ability is often a specific lack and quite independent of other abilities which may be summed up as intelligence." He concludes: "Adequate teaching must presuppose accurate recognition of causes of deficiency, the correction of defects wherever possible, followed by appropriate training. Growth and development in the language field do not take place of their own accord, but they take place in response to suitable treatment."

Plans for a new Rhode Island Hospital are discussed and advocated by the journal.

25 Years Ago
February 1970

The farewell presidential address of the Providence Medical Association, given by Nathan Chaset, MD, is entitled "The Unbelievable 60s: The Problems of the 70s." The author concludes: "If you have a concern for the decade of the 70s, you must join in and afford yourself the opportunity to be a part of the voice of the future. The shape of things to come rests squarely on your shoulders today. Tomorrow may be just too late. Our tremendous strides in medical knowledge, and hopefully our good common sense, may be of little value in the future if we deny at all the great responsibility we have to develop an equally strong social knowledge and awareness, and an equally strong social commitment."

The Rev. Joseph L. Lennon authors a paper entitled, "Social Eyes and Family Mindedness." He stresses the centrality of social responsibility. "Social welfare means: 'I am my brother's keeper.' This entails social responsibility. This responsibility increases with our increased ability to predict long term consequences of environmental forces and developmental charactreristics. If the home, the school, and society do not adequately meet these responsibilities, society will suffer in the long run and our democratic way of life will be weakened."

Robert F. Corrente, MD, reports on 11 verified cases of retained cystic duct remnants.

Wilma F. Rosen, MD, discusses the role of psychoanalysis in the practice of medicine within Rhode Island, demonstrating that it is one of several effective psychiatric therapies available to the practicing physician.

Auriculo-temporal neuralgia, its diagnosis and treatment by appropriate nerve block is described by Edward Damarjian, MD.

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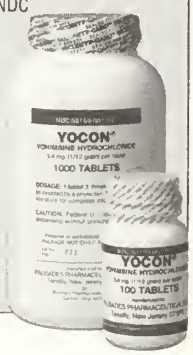

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Manuscripts - Manuscripts will be accepted for consideration with the understanding that they are original contributions, have never been published in its current form, and are submitted only to *Rhode Island Medicine*. An article should address a substantive issue of interest to the Rhode Island medical community. Articles may be no more than 3000 words in length and have no more than 20 references.

Specifications: Manuscripts should be typewritten on one side of the paper only, with double spacing and liberal margins, using 8˚" x 11" non-erasable bond. Tables, charts, and legends should be submitted separately from the text and referred to by number (eg, Fig. 1 or Table 2, etc.) Number pages consecutively.

To expedite production and ensure accuracy, authors are **strongly encouraged** to submit articles as well as computer-generated tables and figures on floppy diskette, formatted in any major MS-DOS or Windows word processor (eg, Microsoft Word, Wordperfect, Wordstar, Xywrite, Multimate, etc.) Macintosh disks will be accepted provided text is saved in an ASCII file. If possible, Macintosh disks should be saved in DOS format, using Apple File Exchange. Diskettes must be accompanied with at least one printed copy of the manuscript. Diskettes will be returned upon request.

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2. Hollingworth JW. *Local and Systemic Complications of Rheumatoid Arthritis*. Philadelphia, Pa: Saunders; 1968.

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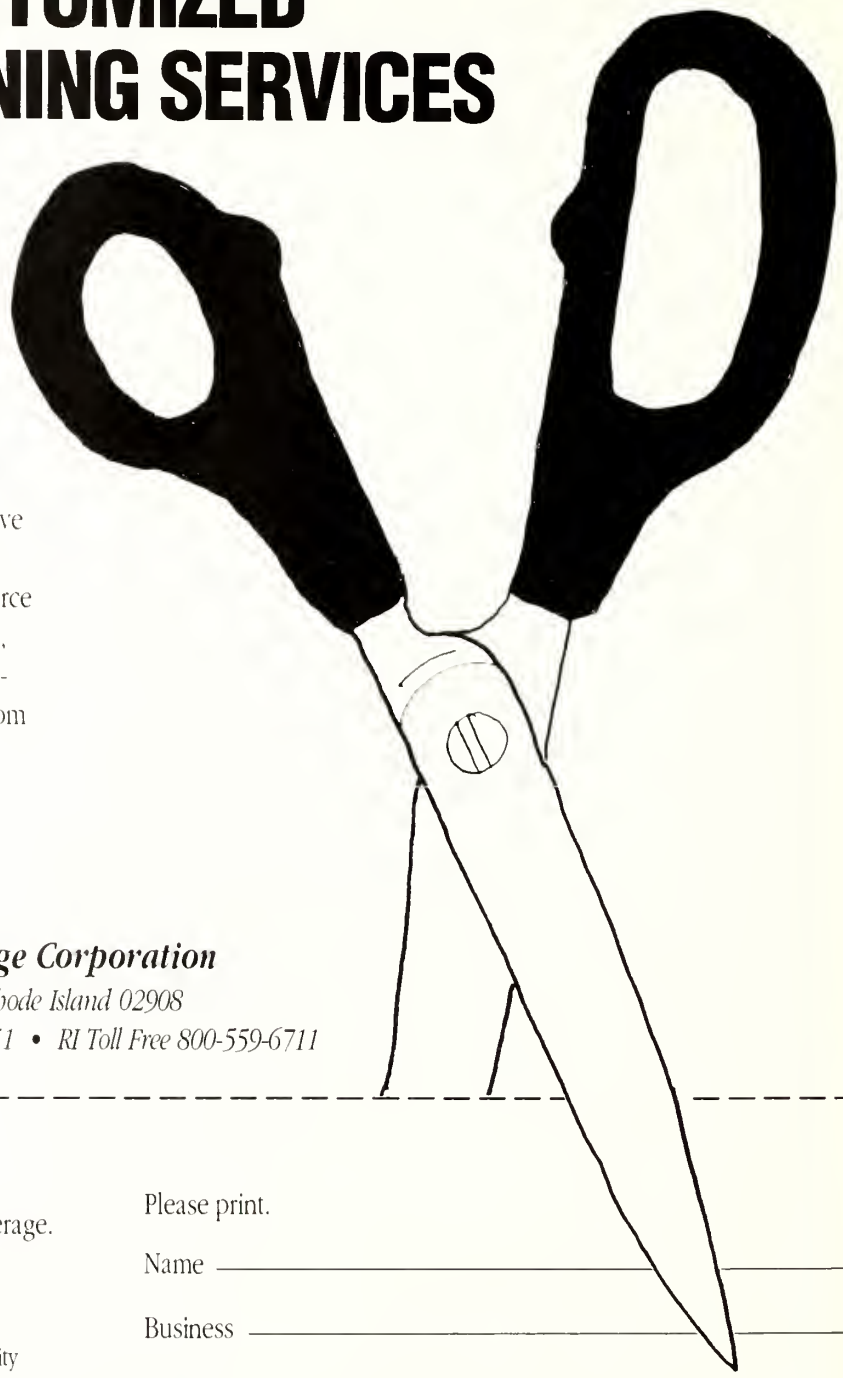

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Cover: Photograph of a recent parade promoting the Pawtucket Heart Health Program.

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COMMENTARIES

Judith Rae Miller, PhD, 1942—1994

The staff of the Rhode Island Department of Health would like to dedicate this issue of RHODE ISLAND MEDICINE to the memory of Judith Rae Miller, PhD, one of the authors of this issue. Judith died on Dec. 16, 1994, after a graceful and courageous struggle with breast cancer. Judith served as project manager of Rhode Island Project ASSIST (the American Stop Smoking Intervention Study), and at Brown University School of Medicine, Judith served had just been promoted to clinical assistant professorof medicine. Judith was an untiring advocate for tobacco control and did much to further tobacco use prevention and cessation in our state. We will miss her greatly.
Barbara A DeBuono, MD, MPH

From Collaboration, Simplicity

As this issue of RHODE ISLAND MEDICINE demonstrates, the promotion of cardiovascular health is a complex undertaking, requiring the simultaneous promotion of a number of health behaviors which in themselves may be complex. As Feldman et al suggest later in this issue:

> Fully translating research knowledge into action requires collaboration and communication between researchers and those who design and implement public policy and programs. The collaborative approach described in this paper is a call for health and social professionals, scientists, policy makers, media organizations, program planners, and representatives of the private and nonprofit sectors in Rhode Island to recognize the importance of working together to improve cardiovascular health statewide.

Collaboration has always been the key to public health. A primary strategy of public health, in fact, is the use of staff to mobilize community resources far beyond the capacity of local and state health departments to provide services by themselves.

I am convinced that Rhode Island is on the right road in promoting cardiovascular health. First, we have the Pawtucket Heart Health Program for a model, a collaborative effort of the first order, as Carleton et al explain. Building on that model, the Division of Preventive Health Services of the Rhode Island Department of Health, with the guidance of the Centers for Disease Control and Prevention, has convened professionals from many disciplines and organizations to write and ultimately to implement a statewide cardiovascular health plan.

As I ponder the complexity of this task, I am reminded that the general public has little patience with complex public health messages. How often have I heard frustrations expressed thus:

"Everything causes cancer!" or "You have to die of something!"

Thus, I call upon the community of physicians to help us keep the message simple, even if the undertaking, in the fullness of its scope, is not. How do we do this? I would suggest the use of four simple themes with the general ("well") public, exemplified by the following statements:

- Don't use tobacco.
- Eat five servings of fruits and vegetables daily.
- Get 30 minutes of moderate exercise daily; walking is good.
- See your primary care provider regularly.

No doubt, the statements themselves need work. And no doubt, we must go way beyond them in guiding patients who experience particular health problems. I offer them only to exemplify the simplicity with which we must communicate with the general public. I call upon the community of physicians in Rhode Island to promote the same messages.
Barbara A DeBuono, MD, MPH

Late Night Thoughts on Reading Nutrition Data Inserts

Through the centuries, food has warmed us, nurtured us, sustained us. Food has become an icon for goodness, generosity and beneficence. Food has provided identity to the nations. Food is central to most functions of society; even life's solemnities—weddings, deaths, rituals—have acted as pretexts for sumptuous dining. The vision of a warm, cheery kitchen symbolizes security and maternal generosity. It is a vision so beguiling that the mere aroma of cooking evokes a cascade of joyous feelings. Indeed, there are few passions to rival the love of food; and so great is this fervor that food occasionally has served as a *substitute* for love.

Food, our daily bread, has always been esteemed as an unqualified blessing; and since local food supplies, in the past, have rarely met local needs, the looming evil then became malnutrition. Only when unlimited food supply turned into an occasional reality did the other face of malnutrition stand revealed: the emergence of life-shortening obesity and obesity-associated diseases (what poet Allen Ginsberg called the monuments to carnivorous civilizations).

Composed at a time when scarcity of food was common, the Bible often mentions hunger and famine. In the wilderness of Sin, a strange new substitute for bread was bestowed upon the wandering, hungry children of Israel. They exclaimed: "What is this?" (In Hebrew, *manna.*) Scholars now believe that scriptural manna was the flower of the tamarisk shrub. On the other hand, when the Bible speaks of obesity it is in terms of disparagement (see Deuteronomy 32:15 where Jeshurun "waxed fat . . . and then he forsook God"). Nor does the Bible give much thought to subtleties such as dietary balance. Pharaoh, speaking to Joseph, says, perhaps metaphorically: "Ye shall eat the fat of the land" (Genesis 45:18).

The less benign aspect of food—partic-

ularly the fats—represents a relatively recent belief. That there are bad as well as good foods inevitably arises. When we inspect the richly glazed desserts displayed in restaurants, who among us has not uttered: "Look at those evil foods!" Fifty years ago, cholesterol was some obscure organic chemical related metabolically to bile and structurally similar to the sex hormones. Half a century ago, the milk with the highest fat content was confidently called Grade A. Half a century ago, the wealthiest in society fortified themselves with "wholesome" breakfasts of eggs, bacon, and muffins drenched in melted butter. The poor grimly ate their drab oat cereal accompanied by a meager slice of toast covered lightly with a butter-substitute called oleomargarine. Today, the situation seems to have been transformed and the privileged now confine their breakfasts to an oat product called granola while the bacon and eggs are reserved for prisoners on the morning of their execution. Morbid obesity is now shown to be inversely proportional to both family income and levels of education. Sadly, in this century, poverty is associated paradoxically with obesity as well as undernutrition.

In recent years anxiety regarding diet has extended beyond the mere worry over the number of consumed calories. Nutritional concerns now consciously preoccupy the supermarket shoppers. How common it is to see the earnest consumer slow her active pace in order to read the fine print on the explanatory labels of packaged foods. Entranced, she pores over the data, engaging in an internal dialectic concerning the nutritional merits of competing products. An otherwise sane adult mumbling audibly in a supermarket lane, more often than not, is debating whether some dietary latitude might be allowed. People, who could not previously distinguish between a cauliflower and a calorie, now assess their intake carefully, dissect their diet into its biochemical components and discourse knowledgeably—and humorlessly—about roughage, essential micronutrients and antioxidant provitamins. For many an apprehensive housewife, knowing that the cardiovascular future of her family rests in her market choices, food selection has become a wrenching experience. The innocent days of chicken soup (with those glistening beads of surface fat), apple pie (smothered in rich vanilla ice cream) and Yorkshire pudding (soaked in steaming gravy) are irreversibly gone, or at least relegated to period movies about Victorian England. Food, no longer a pure and cherished entity, has now contrived to be a two-edge sword.

As a nation, we are indeed healthier, less obese than a decade ago, and certainly less burdened by cardiovascular disability and death. We live longer; yet the older pleasures of eating—and the elemental raptures of sumptuous dining—are now tempered by a sober appreciation of the medical implications of what G.B. Shaw, a resolute vegetarian, had called the eating of dead corpses. Still, there is a small, irrational voice that decries this conversion of the dining experience into an unpleasant arithmetical exercise. This whispered, nutritionally incorrect voice asks whether we have gone too far and have transformed eating into something mechanical, akin to the care of a diesel engine. Some day, some evolutionary biologist may inform us that a biologic advantage truly exists in that fugitive attribute called *enjoyment.*

Eating is human; savoring, however, can be divine. But the edibility of each foodstuff is by no means universal since it rests ultimately in the minds and palates of the consumers. Bierce has defined edible as something good to eat and wholesome to digest, as a worm to a toad, a toad to a snake, a snake to a pig, a pig to a man, and a man to a worm.

Stanley M. Aronson, MD

Ant-Knee (1946-1994)

Haaay Irish," a raspy voice boomed out of the telephone, "Dis is Ant-knee."

"I know who you are, Ant-knee," my secretary Pat replies with a grin. "No one else talks like you."

"I gotta lotta problems. I gotta see Jimmy. You need any sweat suits, Patty? I got nice ones."

Anthony died a few days ago, 7 years beyond his own predicted date of death at 40 years; and for some reason I have been thinking a lot about him. Someone had callously taped his death notice with a snide comment on the surgeons' bulletin board, and I tore it off. I was surprised by how upset I was, something beyond the usual doctor-patient situation; perhaps, I thought, like a spouse missing a terrible marriage after the partner dies. Most patients don't make lasting impressions on their physicians, or if they do it is because of some negative impact, medical outcome or lifestyle. Physicians often become irritated with patients who continue to smoke or drink heavily despite offered help. We tend to be crusaders attempting to change our patients for the better. Anthony had all the negatives. His lightest weight during the 12 years I had known him was 300 lbs. He was under 5 feet in height. He ate through a gastric pouch procedure for morbid obesity. He smoked several packs a day until he underwent a pulmonary lobectomy for chronic infection. He was a diabetic with severe cardiac, bronchial and vertebral disease. And he had numerous surgeries.

Anthony was a true son of Providence, growing up on Federal Hill, always on the periphery of illegal activities; but one was never quite certain just what he did. He functioned as a low-level operative, a pretender to power but never very close to the throne; uneducated, street-smart, perhaps working on his own initiative, and at times for others higher up. Anthony always knew the inside information. If anything big was going down, Anthony would probably be hiding, but he knew the details of dwindling mob power. He also did good things, raising a son, always involved with kids in Little League football. He was good-hearted, even though one felt that these gestures might be stacking the odds for future favors.

Anthony took care of his friends. On occasion, I had whimsically considered consulting Anthony on a "final solution" to certain problems of mine. Anthony also took care of himself. He worked for the city of Providence until he fell off a city truck in the late '70s and thereafter collected compensation. For a brief period he was "in charge of sidewalks" and promptly arranged new driveways for several of his friends. He had spinal stenosis and lumbar disc problems but after two operations continued to have a gimpy right leg. Problems with this leg flared up regularly when he needed attention or wished to be admitted for one of his numerous hospital visits. Generally the admissions ran into weeks because new problems flared up requiring other consultations. He called for his narcotic pills regularly. We always suspected he was saving them to sell later, even though he was seen swallowing them. Although he was bedridden with oxygen running, he would be found wandering the hospital corridors looking in refrigerators. Slowly, Anthony's admissions became more serious. He was on enough diuretic to dry out a watermelon but his lungs were losing the battle. Eight of his lives were used up. He died peacefully in his sleep.

At the wake, the grieving family sat near the coffin. There was a collection and recording of cash donations, clearly a tradition from the past when funds for burial were needed. Although he was nicely done up, Anthony did not fit well in the casket. He looked peaceful: no sweating, no wheezing, no whining. But there was no twinkle in his eyes.

Anthony didn't truck with waiting rooms. He plopped his wheezing frame into a too small chair in front of my secretary's desk.

"Ant-knee, I can't take care of you today; my Jackie's confirmation is tomorrow and I got a lot of cooking to do."

"Oh yeah, well I'll cook for you," he wheezed."

"No, Ant-knee, really, it's all been arranged, we'll do just fine."

"I'm cooking Patty. Dat's it! How many people you havin'?"

Even as a kid on the Hill Anthony was too fat to participate in sports. The other kids found out that he didn't have a swimsuit and they measured his waist so that they could get him one—52 inches was the recollection. But he was good-hearted, well-liked, loved little kids, and he could cook, even preparing feasts for the neighborhood. And he could eat! 32 Olneyville hot weenies at a single setting recalls a friend.

Anthony showed up at the confirmation party with a truckload of food, got help carrying it inside, hung around to chat with Jackie's dad and then took off, back to a different culture.

There is an unwritten premise in medicine that you take them as they are. You can't, in good faith, refuse to care for patients who aren't following advice, or whose lifestyle or ethics you don't agree with. Medical care should be separated, if possible, from other issues.

As I ponder again on my need to write this "requiem for a heavyweight," I realize that for us to judge is hypocrisy. How presumptuous to assume that our lives have greater purpose, that we are possessed of a "better" lifestyle than some of our patients. To paraphrase Horton, we are what we are, and we know what we know 100%. With Anthony there were no surprises; he was a genuine article, and he played his given role to perfection. I appreciated that, and it was the basis for our relationship.

On one of his last visits to the office, he told us that he had a joint interest in a greyhound currently running in the money in Florida. He named the dog M.C. McLennan. What a unique tribute, I thought, as I left the office that evening. Anthony, likely, is the most unforgettable character I will ever know.

The prayer of St. Francis of Assisi, chosen for Anthony's wake, contains the essence of the enigma that was this little giant:

Where there is injury, pardon;
Where there is doubt, faith;
Where there is despair, hope;
Where there is darkness, light;
. . . To be understood as to understand;
To be loved as to love.

Goodbye my friend.

James E. McLennan, MD
Providence RI

A Hemiplegia of Words

At the onset of professional schooling, the first year medical student is confronted with a burdensome curriculum, a new moral ethic and an arcane language embedded in the classical tongues. Despite assurances that the uses of Latin and Greek are totally rational, the bewildered student encounters, instead, lapses of rules and countless semantic ambiguities. Take, for example, the word hemiplegia. The *-plegia* root, from the Greek, suggests a blow or a stroke (the word, plague, shares the same ancestry); and the *hemi-* prefix, also Greek, tells the student that half of the body is affected. But, asks the student, which half? Is it both legs, or rather a leg and an arm ipsilaterally located? Is the plane separating the normal from the abnormal drawn cross-sectionally or sagittally? And after resolving that, what then is paraplegia? Or diplegia?

By convention—certainly not by semantic rules—hemiplegia denotes a paralysis affecting one side or another, with "side" defined by the neuraxis. Paraplegia (*para-* from the Greek, meaning "next to" or "almost") describes, instead, a paralysis of both lower limbs and sometimes, as well, the lower trunk. The prefix, *para-* , in most instances, conveys the meaning of "next to" or "almost" (as in paramedic); in the word paraplegia, however, a more remote meaning of *para-* is employed, as something "beyond" (ie, beyond the body). Diplegia, on the other hand, means twice paralyzed *(di-*, a Greek prefix meaning twice) and denotes any paralysis involving corresponding limbs or even bilateral facial musculature. Diplegia is customarily reserved for the palsies associated with birth.

Our medical student observes that a number of biomedical prefixes have similar, overlapping or identical meanings: among these are *hemi-, demi-, semi-, cli-, bi-, and quasi-*. The student must then learn that there is no central admissions committee studiously weighing each candidate-word for linguistic consistency, semantic merit or lack of ambiguity. As societal needs change, new words will be assembled ceaselessly, with neither permission nor supervision, while old words (or their elements) are recycled, often with altered meanings. As a rule these qualifying prefixes are employed separately; only the musicians, in their bohemian abandon, have combined them within a single word, hemidemisemiquaver (a sixty-fourth note.) Language, the medical student finally appreciates, is constantly evolving in a thoroughly sloppy manner. Lexicographers—and their dictionaries—can merely tell the student what is, not what ought to be.

The prefix *demi-*, rarely used in biomedical terminology, descends from the Latin *dimedius* meaning half, as in the English word, demimonde. The prefix *di-* is of Greek origin and means twice (eg, dichromatic, digastric, diopter). In most instances it is allied with a Greek root. The prefix *bi-* on the other hand, is Latin denoting duality (eg, biceps, biconvex, bicuspid, bipolar). Similarly, this prefix is joined with roots of Latin origin. Thus, we may have pairs of words of somewhat similar meaning, one Latin and one Greek (eg, binocular (L.) and diopter (Gr.); biceps (L., meaning two heads) and digastric (Gr., meaning two bellies)). The prefix *hemi-* is Greek, meaning half (eg, hemicolectomy, hemianopsia). The prefix *semi-* is Latin also meaning half and is found in such words as semilunar. While there are undeniable exceptions to the rule of ligating Latin-to-Latin and Greek-to-Greek (eg, semicomatose, where *semi-* is Latin and *koma* is Greek), the number of examples complying with this regulation far outnumber the hybrid anomalies; the rule provides, therefore, some limited guidance.

Problems arise particularly when these prefixes serve to define intervals of time. Thus, semimonthly means twice each month, while bimonthly means once every two months. The consistency of the rule breaks down when, for example, biweekly is taken to mean either twice per week or once in alternate weeks. The prescription abbreviation BID (Latin, *bis in die*) signifies not once every other day (as in bimonthly) but twice each day. Very confusing. Fowler, the arbiter of modern English usage, wisely observes: "There is no reason why *bi-* hybrids should not be allowed to perish and the natural and unambiguous 'two-hourly or "half-hourly' . . . be used regularly."

The prefix *quasi-* began life as a fusion of two independent Latin words, *quam si,* meaning, "as much as;" currently it conveys the sense of "being virtually so" (as in the word quasi-official.) The *quasi-* prefix is uncommonly used in current medical terminology. It does, however, appear in the opening words of the introit for the post-Easter Low Sunday Mass *(quasi modo,* meaning "as if just now"). Infants born on this Sunday have sometimes been given that name (see Victor Hugo's *Hunchback of Notre Dame*, Quasimodo.)

But, pleads the resigned medical student, is there any logic to medical terminology? In the immortal response of Tweedledee, "Contrariwise, if it was so, it might be; and if it were so, it would be: but as it isn't, it ain't. That's logic."

Stanley M. Aronson, MD

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Cardiovascular Disease Mortality in RI, 1986–1991

Jana E. Hesser, PhD
Jay Buechner, PhD

Rhode Island is close to achieving its cardiovascular disease prevention program objective to reduce stroke mortality to no more than 20/100,000 by the year 2000, and is approaching its objective to reduce ischemic heart disease mortality to no more than 90/100,000 by the year 2000.

Cardiovascular disease (CVD) is the leading cause of death, disability, and health care expenditures in the United States as it has been for the past 50 years.[1] It also is the leading cause of death in Rhode Island.

Fortunately, mortality attributed to CVD has declined substantially over the past 26 years, due in large part to lifestyle changes affecting some of the risk factors associated with CVD, (eg, smoking, diet, physical activity, and control of high blood pressure and high serum cholesterol).[2]

This paper addresses cardiovascular disease mortality in Rhode Island for the period 1986-1991. It looks at recent trends in CVD mortality, and identifies disparities in the CVD mortality of subpopulations. It is designed to inform planning for CVD control efforts in Rhode Island, with special focus on groups at high risk for CVD. It also provides a baseline against which to measure progress, as Rhode Island works to achieve its Year 2000 objectives for cardiovascular disease reduction.

Methods

CVD encompasses a broad range of diseases affecting the heart, blood vessels, and circulatory system. These diseases may be grouped into four major categories:

1. Cerebrovascular disease or stroke;
2. Ischemic or coronary heart disease (IHD);
3. All other diseases of the heart (such as hypertensive heart disease and rheumatic heart disease); and
4. All other cardiovascular diseases (such as atherosclerosis, hypertension with or without renal disease, and all other diseases of arteries, arterioles, and capillaries).

In compiling mortality statistics, national and state vital statistics data centers identify deaths from cardiovascular disease using the International Classification of Diseases (ICD), range 390-448. This standard is used in the present study. Cerebrovascular diseases (ICD 430-438), and Diseases of the Heart (ICD 390-398, 402, 404-429) account for more than 90% of all cardiovascular disease mortality.

The data used for this report were obtained from the Centers for Disease Control and Prevention (CDC) via WONDER/PC, a program which allows health departments direct access to CDC databases. The CDC routinely receives mortality data from every state, including data from the Office of Vital Records, Rhode Island Department of Health. Rhode Island's mortality medical data are coded by the National Center for Health Statistics (NCHS), as well as by the state itself, and there is close agreement between the two. The CDC's mortality data for Rhode Island, used for this report, use NCHS coding, which has not changed in the period 1986-1991.[3]

All data were adjusted for age using the direct method of standardization. The 1940 population of the U.S. was used as the standard population in this process. Intercensal population estimates derived by the CDC from results of the 1990 U.S. Census of population for Rhode Island were used to calculate age-specific annual mortality rates for Rhode Island, 1986-1991. Annual age-specific mortality rates were used as the building blocks of age-standardized rates. Unless otherwise specified, all rates refer to the total resident population of Rhode Island.

Results

In 1991, the most recent year for which Rhode Island statistics are available, cardiovascular diseases killed 4,077 persons, accounting for 43% of the 9,398 resident deaths in that year. Diseases of the heart (including IHD) accounted for 3,247 of these deaths, stroke accounted for another 567 deaths, and and all other types of cardiovascular disease accounted for 263 deaths. Cancer, the second leading cause of

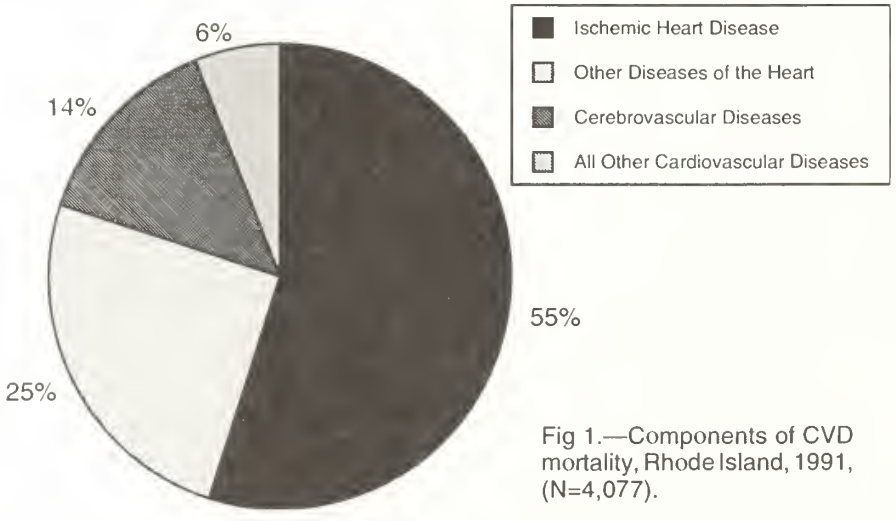

Fig 1.—Components of CVD mortality, Rhode Island, 1991, (N=4,077).

ABBREVIATIONS USED
CDC: Centers for Disease Control and Prevention
COPD: Chronic obstructive pulmonary disease
CVD: Cardiovascular disease
ICD: International Classification of Diseases
IHD: Ischemic heart disease
NCHS: National Center for Health Statistics

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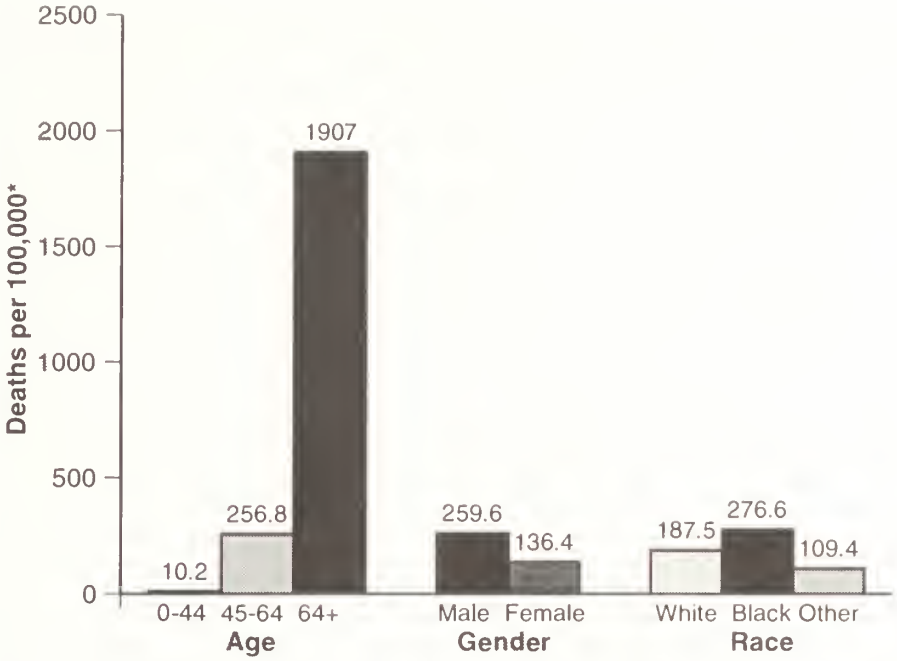

Fig 2.—CVD mortality by age, gender, and race Rhode Island, 1991.
* Rates adjusted to 1940 census population.

death, killed 2,370 persons (25% of resident deaths), while chronic obstructive pulmonary diseases (COPD), the third leading cause of death, killed 314 persons.

Ischemic (coronary) heart disease (IHD) was the single most important cause of CVD mortality, accounting for 55% of all CVD deaths in 1991; 25% of CVD deaths were attributable to other heart disease; 14% were due to stroke. Six percent of CVD deaths were attributable to all other forms of CVD (Figure 1).

Since 1979 the CVD mortality rate in Rhode Island has been lower than the national rate, after age-adjustment. In 1991 the age-adjusted CVD mortality rate was 167.4/100,000 for Rhode Island, 184.9/100,000 for the nation as a whole.

Demographics of Cardiovascular Disease Mortality

The risk of death due to CVD is not the same for all individuals. Older adults, especially the elderly, are at higher risk than children and young adults; men are at higher risk than women; blacks are at higher risk than whites, whites are at higher risk than "other" (non-white/non-black) racial groups. Figure 2 and Table 1 depict these CVD mortality differentials for Rhode Island, 1986-1991.

In the period 1986-1991 86% of all CVD mortality in Rhode Island occurred among persons ages 65 and over, while only 2% occurred among individuals under age 45. The CVD age-adjusted mortality rate of 1,907/100,000 among persons ages 65 and over was nearly 8 times that of persons ages 45-64. For stroke, the mortality rate of 252.9/100,000 for persons ages 65 and over was more than 10 times the rate for persons ages 45-64.

In the period 1986-1991, the age-adjusted CVD mortality rate was 90% higher for males than females, due primarily to a large mortality differential for diseases of the heart, 218/100,000 versus 107/100,000, respectively. The male versus female mortality differential for stroke was considerably smaller, 26/100,000 for males versus 21/100,000 for females.

Blacks had the highest CVD mortality rate of any group other than the elderly. Black CVD mortality was 48% higher than white CVD mortality. Of note is the black/white differential for stroke mortality, 93% higher for blacks than whites. IHD mortality was also 24% higher among blacks than whites.

The CVD mortality rate for persons of "other" races (non-white/non-black; predominantly Asians in Rhode Island) is considerably lower than either white or black rates, and may be attributable in part to the under-reporting of "other" racial categories on death certificates. However, national data indicate that persons of non-white/non-black racial groups do have lower CVD mortality than whites.[2] In Rhode Island, white and black CVD mortality rates are 71% and 153% higher, respectively, than "other" CVD mortality rates, (Table 1).

Declines in CVD Mortality

CVD mortality has declined in Rhode Island since 1968,[4] as it has nationally. Between 1986 and 1991 Rhode Island's CVD mortality rate declined 22%, compared with a 15% decline for the U.S. (Figure 3).

The drop in overall CVD mortality in Rhode Island between 1986 and 1991 was due partly to a 37% drop in IHD mortality and partly to a 17% drop in stroke mortality (Table 2). While these drops reflected national trends, Rhode Island exhibited simultaneous increases in other CVD mortality (4%) and mortality from other diseases of the heart (24%) which were not seen nationally (Table 2 and Figure 4).

It is important to consider whether all subgroups shared these mortality changes equally. Table 2 depicts the percentage change in age-adjusted mortality rates from 1986 to 1991 by race, sex, and age.

Whites and blacks experienced similar changes in mortality from all CVD and from IHD. (The number of black stroke deaths was too small to enable meaningful comparisons from one year to the next.) Males and females experienced similar

Table 1.—Age-adjusted cardiovascular disease mortality by age, gender, and race, Rhode Island, 1986-1991 (deaths per 100,000).

	All CVD	Diseases of the Heart	Stroke	All Other CVD	Ischemic Heart Disease	All Other Diseases of the Heart
All	189		23	11	112	
Age						
<45	10	8	2	1	64	4
45-64	257	218	24	17	155	64
65+	1907	1539	253	115	1148	391
Gender						
Male	260	218	26	16	159	58
Female	136	107	21	8	77	30
Race						
White	188	154	23	11	112	42
Black	277	213	44	20	139	74
Other	109	87	18	4	59	29

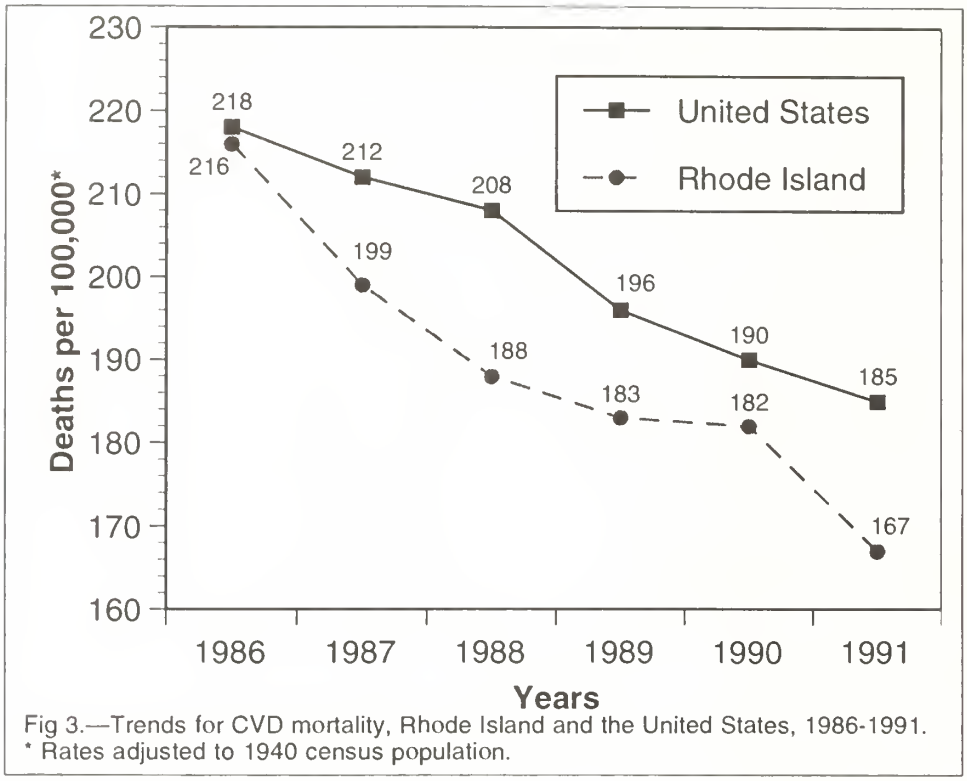

Fig 3.—Trends for CVD mortality, Rhode Island and the United States, 1986-1991.
* Rates adjusted to 1940 census population.

changes in mortality from all CVD, from IHD, from stroke, and from all other diseases of the heart. However, blacks and whites experienced different changes in mortality from all other diseases of the heart, and males and females experienced different changes in mortality from all other cardiovascular diseases:

- Mortality from all other diseases of the heart increased 26% among whites, but remained unchanged among blacks.
- Mortality from all other cardiovascular diseases increased 21% among males, but decreased 16% among females.

A few age differentials also stood out:

- The greatest decline (-26%) in CVD mortality occurred among persons ages 45-64.
- The greatest decline (-57%) in IHD mortality occurred among persons less than 45 years of age.
- The most substantial decline (-17%) in stroke mortality occurred among persons ages 45-64. (Numbers were to small in the youngest age group for valid calculations to be made.)
- Among persons less than 45 years of age, the increase (47%) in mortality from all other diseases of the heart was almost twice as large as the increase experienced by persons in older age groups and offset the substantial decline in IHD among the former.

Discussion

Rhode Island experienced a substantial decline in overall CVD mortality between 1986 and 1991. Overall, Rhode Island's experience was similar to that of the nation as a whole, but Rhode Island differed from the U.S. in its apparent increases in mortality from CVD other than IHD and stroke. Whether this increase was real, or reflects differences in the reporting of causes of death, it merits further study.

Future Prospects for CVD Prevention in Rhode Island

Many of Rhode Island's Year 2000 Health objectives relate to CVD prevention. The overall picture for Rhode Island is very positive, since CVD mortality, which at one time was higher than national levels, has dropped below national rates and is outpacing the national downward trend.

Rhode Island is close to achieving its CVD Prevention Program objective to reduce stroke mortality to no more than 20/100,000 by the year 2000, and is approaching its objective to reduce ischemic heart disease mortality to no more than 90/100,000 by the year 2000. However, all groups have not shared equally in this positive experience, and those that have not should become the focus of prevention efforts in the state.

It is estimated that about 60% of the recent decline in CVD mortality may be attributed to changes in lifestyle, ie, declines in cigarette smoking, reductions in serum cholesterol and uncontrolled hypertension, and improved exercise habits.[4] A companion paper in this volume looks at Rhode Island's progress in reducing CVD risk factors.

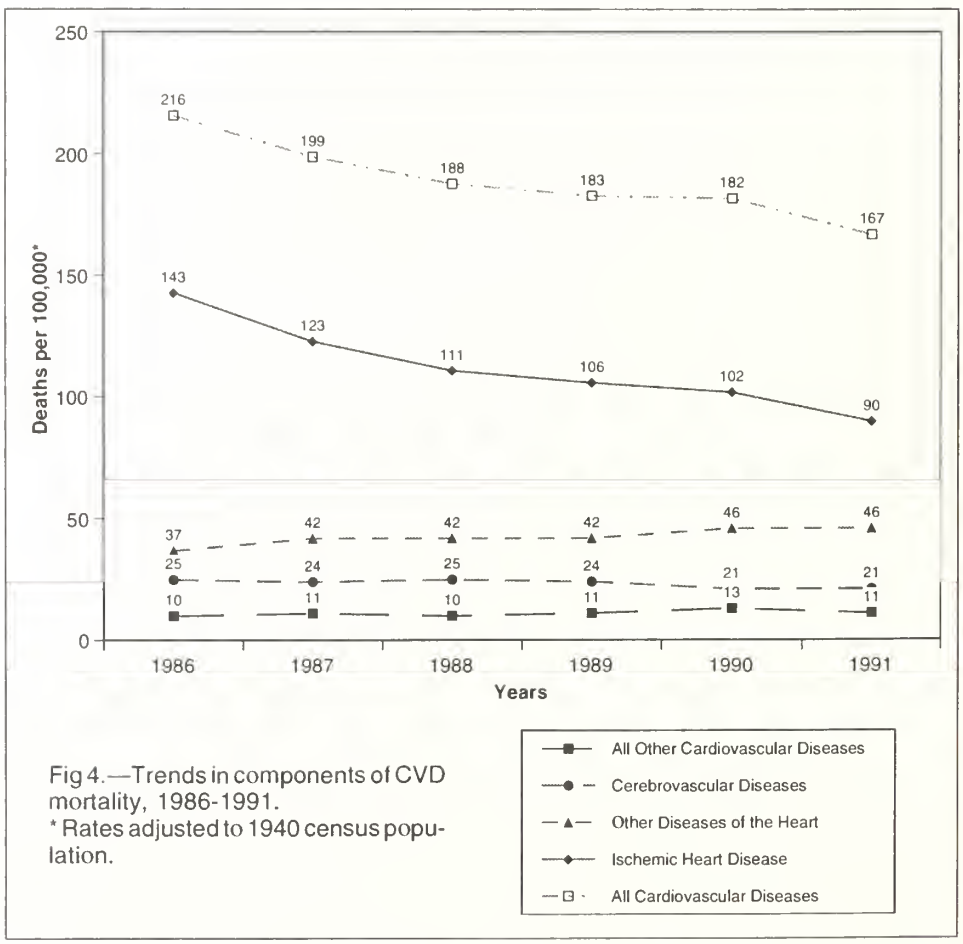

Fig 4.—Trends in components of CVD mortality, 1986-1991.
* Rates adjusted to 1940 census population.

Table 2.—Age-adjusted mortality rates by age, gender, and race, and percentage change in components of CVD mortality between 1986 and 1991, Rhode Island (deaths per 100,000).

	All CVD			Stroke			Ischemic Heart Disease			All Other CVD			All Other Diseases of the Heart		
	1986	1991	%Chg	1986	1991	%Chg	1986	1991	%Chg	1986	1991	%Chg	1986	1991	%Chg
All	216	167	-22%	25	21	-17%	143	90	-37%	10	11	+4%	37	46	+24%
Age															
<45	12	12	-6%	-*	-	-	7	3	-57%	-	-	-	4	6	+47%
45-64	301	221	-26%	26	21	-17%	207	115	-44%	12	16	+37%	57	69	+22%
65+	2148	1682	-22%	284	218	-13%	1416	949	-33%	115	110	-4%	333	405	+22%
Gender															
Male	295	232	-22%	28	23	-18%	202	128	-37%	14	17	+21%	51	64	+27%
Female	155	121	-23%	23	19	-16%	98	63	-36%	9	7	-16%	26	31	+23%
Race															
White	214	165	-23%	25	20	-19%	142	89	-35%	11	11	+3%	36	45	+26%
Black	338	274	-19%	-	-	-	206	137	-34%	-	-	-	71	71	0%

* Numbers too small to calculate rates.

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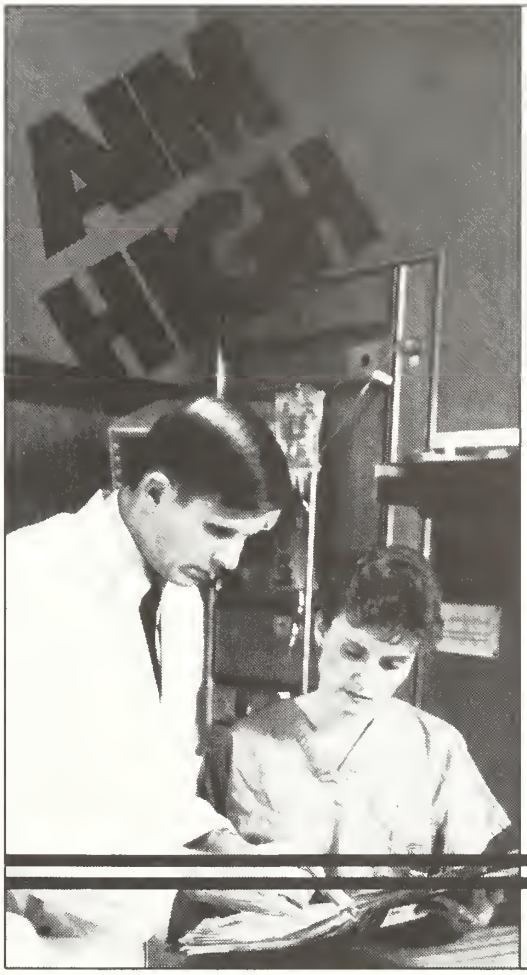

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Cardiovascular Disease Risk Factors and Preventive Practices in Rhode Island, 1988 and 1992

Jana E. Hesser, PhD, Josefina F. Reynes, PhD, Jay Buechner, PhD

Six risk factors for cardiovascular disease considered in the present analysis include: obesity, high blood pressure, high blood cholesterol, sedentary life style, current cigarette smoking, and diabetes.

Cardiovascular disease (CVD) is the leading cause of death, disability, and health care expenditures in the United States. Fortunately, the CVD mortality rate has declined in the past 15 years: 35% for all cardiovascular diseases, 40% for coronary heart disease, and more than 50% for stroke. These declines have been attributed largely to changes in lifestyle and reduction in the major modifiable risk factors for CVD, including high blood pressure, high blood cholesterol, and cigarette smoking. Other modifiable risk factors include overweight, sedentary lifestyle, and diabetes.[1]

This paper addresses modifiable risk factors for CVD and prevention-related health behaviors among Rhode Islanders for the years 1988 and 1992. It looks at changes in the prevalence of these risk factors and health behaviors, and identifies disparities between gender and age subgroups. Results are useful for the planning and development of programs to control CVD. They also serve as indicators against which to measure progress as Rhode Island moves towards its Year 2000 Health Objectives.[2]

Methods

The data for this study come from the Behavioral Risk Factor Surveillance System (BRFSS),[3] currently funded by the Centers for Disease Control and Prevention (CDC) in 50 states and 4 territories (37 states participated in 1988, 49 in 1992). The BRFSS is an annual telephone survey of randomly selected residents age 18 and older who live in households with telephones. It asks respondents questions about demographic characteristics and a variety of health behaviors, including those related to CVD. The BRFSS is used by the CDC in conjunction with state health departments to measure prevalence and time trends for health-related behaviors in individual states and in the U.S. as a whole.

The BRFSS has been conducted in Rhode Island each year since 1984. Comparable risk factor data were collected for many items in 1988 and 1992. In 1988 and 1992 the Rhode Island BRFSS surveyed, respectively, 1763 and 1808 randomly selected persons ages 18 and older living in households with telephones. Weights are applied to BRFSS data so that results may be generalized to the entire population of the state.

Six risk factors for CVD considered in the present analysis include: obesity, high blood pressure, high blood cholesterol, sedentary life style, current cigarette smoking, and diabetes:

- Overweight is defined as a body mass index of 27.8 or more for males and 27.3 or more for females. (Body mass index = weight in kilograms divided by height in meters squared.)
- Hypertension and high cholesterol are dichotomous variables indicating that a respondent, screened in the past 2 years for either measure, has been told by a medical provider that he or she has high blood pressure or high cholesterol.
- Sedentary lifestyle is defined as no physical activity performed for less than 20 minutes and/or less than three times a week during the past month.
- Current regular smoking is defined as having ever smoked 100 cigarettes and smoking regularly now.
- Diabetes is a dichotomous variable indicating that a respondent has been told by a medical provider that he or she has diabetes.

CVD prevention behaviors include:

- Hypertension screening in the past 2 years;
- Cholesterol screening in the past 2 years
- Having had a routine medical checkup in the past 12 months; and
- Engaging in regular physical activity.

Data for hypertension and cholesterol screening, and having had a medical checkup in the past 12 months, are based on responses to direct questions regarding these items. Engaging in regular physical activity indicates participation in physical activity for 20 minutes or more at a time, 3 times or more each week.

Sociodemographic characteristics examined consist of:

- Age in years grouped as 18-44, 45-64, and 65+;
- Gender;
- Marital status (married or unmarried);
- Education (having any college education or having only a high school education or less); and
- Work status (currently employed or not employed).

In each of the 2 years, the prevalence of CVD risk factors and prevention practices were generated using logistic regression analysis in SAS,[4] with adjustment for the confounding effects of age, gender, marital status, education, and work status. Adjustments for having had a routine medical checkup in the last 12 months were also made, because having had one affects the likelihood of screening for high blood pressure and high cholesterol. The significance of the effect of time on risk factor and prevention variables was also assessed. Throughout the analysis, statistics for high blood pressure (hypertension) and high cholesterol are presented only for persons

ABBREVIATIONS USED
BMI: Body mass index
BRFSS: Behavioral Risk Factor Surveillance System
CDC: Centers for Disease Control and Prevention
CVD: Cardiovascular disease
HBP: High blood pressure
SAS: Statistical Analysis System

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Table 1.—Cardiovascular risk profiles of adult Rhode Islanders, 1988 and 1992, by gender.

CVD Risk Factors[a]	1988	1992	Change over Time[b] *P*-Value
% Overweight	20.9	24.2	.0001
Males	22.2***	22.6*	.2854
Females	19.7	25.5	.0001
% Hypertensive	13.5	19.8	.0001
Males	11.8***	20.4***	.0001
Females	15.2	18.9	.0001
% High Cholesterol	6.7	15.2	.0001
Males	4.8***	14.8	.0001
Females	8.3	15.2	.0001
% Sedentary	65.6	50.2	.0001
Males	62.0***	46.0***	.0001
Females	68.1	53.9	.0001
% Current Smoker	23.5	21.2	.0001
Males	23.7	23.5**	.4727
Females	23.3	18.9	.0001
% Diabetes[c]	3.9	3.5	.0146

a - Weighted percentages with adjustments for age, gender, marital status, education, employment status, and having had a routine medical checkup In the past year.
b - Generated through the inclusion of a "year" variable in a logistic regression model.
c - Cases were too few for multivariate procedure, hence dropped In further analyses.
Notes:
Overweight = BMI >27.8 for males and >27.3 for females.
Hypertensive = Medical personnel-verified high blood pressure, screened in past two years.
High Cholesterol = Medical personnel-verified high cholesterol, screened in past two years.
Sedentary = No regular physical activity.
Current Smoker = Ever smoked 100 cigarettes and currently smoking.
Diabetes = Medical personnel-verified diabettes.
*** = Genders significantly different at *P*<.0001;
** = At *P*<.001;
* = At *P*<.01.

Table 2.—Cardiovascular risk profiles of adults Rhode Islanders 1988 and 1992, by age group.

CVD Risk Factors[a]	1988	1992	Change over Time[b] *P*-Value
% Overweight	20.9	24.2	.0001
18-44	13.8***	18.7***	.0001
45-64	35.5***	32.8	.0573
65+	21.8	31.6	.2222
% Hypertensive	13.5	19.8	.0001
18-44	6.5***	10.8***	.0001
45-64	23.7***	28.6***	.0001
65+	33.8	50.0	.0001
% High Cholesterol	6.7	15.2	.0001
18-44	3.6**	8.1***	.0001
45-64	11.9***	29.1	.0001
65+	13.0	27.6	.0001
% Sedentary	65.6	50.2	.0001
18-44	58.1***	45.1***	.0001
45-64	69.4***	53.2***	.0001
65+	79.3	61.3	.0001
% Current smoker	23.5	21.2	.0001
18-44	27.0***	23.5***	.0250
45-64	25.5***	25.9***	.1001
65+	15.4	4.5	.0001

a - Weighted percentages were adjusted for gender, marital status, education, work status, and having had a routine medical checkup in the past year.
b - Generated through the inclusion of a "year" variable in a logistic regression model.
Notes:
Overweight = BMI >27.8 for males and >27.3 for females.
Hypertensive = Medical personnel-verified high blood pressure, screened in past two years.
High Cholesterol = Medical personnel-verified high cholesterol, screened in past two years.
Sedentary = No regular physical activity.
Current Smoker = Ever smoked 100 cigarettes and currently smoking.
*** = Age groups significantly different at p<.0001;
** = At p<.001.

screened for these measures within the last two years. The decision to apply this criterion was made to assess hypertension and cholesterol within individuals whose diagnosis has been confirmed recently. Diabetes was not included in multivariate analysis because of the very small number of respondents reporting this disease.

Results

Cardiovascular Disease Risk Factors

The population prevalences of the six CVD risk factors in 1988 and 1992 (with adjustments for age, gender, marital status, education, work status, and routine medical checkup in the last 12 months) demonstrate significant changes over the four year period (Table 1). The proportion of overweight adults has increased from a fifth of the population in 1988 to almost a quarter in 1992. Of those having had their blood pressure and/or cholesterol checked in the past two years, the proportions who report having been told they have high blood pressure or high blood cholesterol have increased significantly. Close to 20% reported being hypertensive in 1992, compared with 13.5% in 1988; 15.2% reported high cholesterol in 1992, more than double the proportion of 6.7% in 1988. On the other hand, the prevalence of sedentary behavior decreased significantly from 1988 to 1992, from 65.6% to 50.2%; the prevalence of current smoking also decreased a small but significant amount, from 23.5% to 21.2%; and the proportion who reported that they had been told they have diabetes decreased slightly, but significantly, from 3.9% to 3.0%.

Gender comparisons for these risk factors were made in Table 1. Significant differences existed between males and females in 1988, with females at higher risk for hypertension, high cholesterol, and sedentary lifestyle and at lower risk for overweight. In 1992 females were at greater risk than males for overweight and sedentary lifestyle. Between 1988 and 1992 significant increases occurred in hypertension and high cholesterol among males *and* females. while both had significant decreases in sedentary lifestyle. Among females, overweight increased significantly (from 19.7% to 25.5%), while smoking declined (from 23.8% to 18.8%) between 1988 and 1992.

Variability in the occurrence of CVD risk factors among younger (18-44), middle age (45-64), and older adults (65+) were also examined within and across years (Table 2). In both the 1988 and 1992 surveys, the prevalence of overweight among the youngest (18-44) age group was significantly lower than among older age groups. However, there was a significant increase in the percent

Table 3.—Cardiovascular disease preventive practices of adult Rhode Islanders, 1988 and 1992, by gender.

CVD Risk Factors[a]	1988	1992	Change over Time[b] *P*-Value
% Regular Phys Activity	34.3	49.8	.0001
Male	40.2*	54.0**	.0001
Female	31.6	41.9	.0001
% Screen/2 yrs: HBP	98.3	95.4	.0001
Male	97.9	93.0*	.0001
Female	98.8	97.0	.0001
% Screen/2 yrs: Cholest	49.1	69.3	.0001
Male	48.2*	68.9	.0001
Female	50.9	69.7	.0001
% Routine Med Chkup/1 yrc	80.5	75.7	.0001
Male	73.1***	69.8***	.0001
Female	81.3	80.4	.1101

a - Weighted percentages with adjustments for age, gender, marital status, education, employment status, and having had a routine medical checkup in the past year.
b - Generated through the inclusion of a "year" variable in a logistic regression model.
c - Adjustments for age, gender, marital status, education, and employment status.
Notes:
*** = Genders significantly different at $P<.0001$;
** = At $P< .001$;
* = At $P< .01$.

Table 4. Cardiovascular disease practices of adult Rhode Islanders, 1988 and 1992, by age group.

CVD Risk Factors[a]	1988	1992	Change over Time[b] *P*-Value
% Regular Phys Activity	34.3	49.8	.0001
18-44	54.1***	54.9***	.0909
45-64	30.8***	46.8 ***	.0001
65+	19.3	38.7	.0001
% Screen/2 yrs: HBP	98.3	95.4	.0001
18-44	97.5***	94.9*	.0001
45-64	-c-	94.5**	
65+	98.9	97.7	.0829
% Screen/2 yrs: Cholest	49.1	69.3	.0001
18-44	34.4***	52.6***	.0001
45-64	70.7**	86.3	.0003
65+	65.2	86.8	.0001
% Routine Med Chkup/1 yr[d]	80.5	75.7	.0001
18-44	75.4***	68.9***	.0001
45-64	82.3***	76.5***	.0001
65+	80.2	92.9	.0001

a - Weighted percentages with adjustments for age, gender, marital status, education, employment status, and having had a routine medical checkup in the past year.
b - Generated through the inclusion of a "year" variable in a logistic regression model.
c - No rate was generated, as only 18 respondents had no checkup in the past year.
d - Adjustments for age, gender, marital status, education, and employment status.
Notes:
*** = Age groups significantly different at $P<.001$
** = At $P<.001$
* = At $P<.01$

overweight among persons ages 18-44 between 1988 and 1992.

In 1988 and 1992 among those screened in the past two years, the prevalence of hypertension was significantly higher among elders than among persons in other age groups. However, from 1988 to 1992, the prevalence of hypertension increased significantly among persons ages 18-44, as well as among elders. Although persons in the two older age groups were more likely to have reported high cholesterol than persons in the youngest group, the proportion reporting high cholesterol increased significantly in each age group from 1988 to 1992.

The prevalence of sedentary lifestyle was higher among elders than among persons in the two younger age groups, but the prevalence of sedentary lifestyle decreased significantly in all three groups between 1988 and 1992. Younger adults were more likely than older adults to have been current smokers in 1988, while those 45-64 were more likely to be current smokers in 1992. Between 1988 and 1992 there was a significant decrease in current smoking in the youngest and oldest age groups.

Cardiovascular Disease Prevention Practices

In the general population, a number of significant changes in CVD prevention practices occurred between 1988 and 1992, and these were examined across gender and age groups (Tables 3 and 4). The proportion of the population engaging in regular physical exercise increased significantly from 1988 to 1992 (from 34% to 50%). This observation held for males, females, and each of the three age groups, although males were more likely to exercise than females, and younger adults were more likely to engage in physical activity than elders.

The prevalence of screening for cholesterol in the past two years also increased significantly (from 49% to 69%). This observation also held for males, females, and each of the three age groups groups. However, cholesterol screening was much more likely to have taken place among adults ages 45 and older than among younger adults.

Participation in blood pressure screening in the past two years, although very nearly universal in both 1988 and 1992, declined slightly, but significantly, in the interim (from 98% to 95%). In 1992 males were less likely than females to have been screened recently for hypertension.

The prevalence of routine medical checkup in the past 12 months decreased significantly (from 81% to 76%) between 1988 and 1992. A significant decrease occurred among males and among those ages 64 and under. Only the elderly had a significant increase in the prevalence of routine medical checkups. Females were more likely to have had a routine medical checkup than males in both years.

Exercise Among High Risk Respondents

Adjusting for the known sociodemographic confounders (age, gender, marital status, education, work status, and medical checkup in the past 12 months), the prevalence of regular exercise among those identified as high risk respondents was also examined. The practice of regular physical activity among those who were overweight, among those who had high blood pressure, and among those with high blood cholesterol levels increased significantly between 1988 and 1992 (Figure 1).

Discussion

There was significant change in the prevalence of each CVD risk factor between 1988 and 1992, including positive and negative changes. Positive changes included:

- Decrease in current smoking

- Decrease in sedentary lifestyle
- Increase in cholesterol screening
- Decrease in reported diabetes

Negative changes included:

- Increase in overweight
- Increase in hypertension
- Increase in high cholesterol

Results also suggest that increases in overweight occurred primarily among females and among younger adults (ages 18-44). On the other hand, smoking levels dropped among females, but not among males.

The increase in the prevalence of high cholesterol in all groups between 1988 and 1992 may be a product of the significant increase in cholesterol screening which occurred in this period. Increased cholesterol screening may reflect an increased awareness of high cholesterol as a CVD risk factor.

When Rhode Island risk factor data (overweight, hypertension, high cholesterol, sedentary lifestyle, and current smoking) are compared with U.S. data, as represented by the median of all states participating in the BRFSS.[5,6] Rhode Island ranks below the national median, or has a lower prevalence for each risk factor, with the exception of current smoking, which equals that of the median state. Rhode Island also experienced a larger drop in the proportion sedentary between 1988 and 1992 than occurred nationally.

The increase in regular physical activity, especially among those who are overweight, or who have hypertension or high cholesterol, the declines in sedentary lifestyle and smoking, and the increase in cholesterol screening, reflect the success of both national and local public health efforts in recent years to effect positive behavior change. The Rhode Island data reveal steady movement toward achievement of Year 2000 Health Objectives relevant to CVD. The task will be to maintain this momentum in physical activity, cholesterol screening, and smoking cessation, and to reverse increases in overweight, hypertension, and declines in hypertension screening and routine medical checkups.

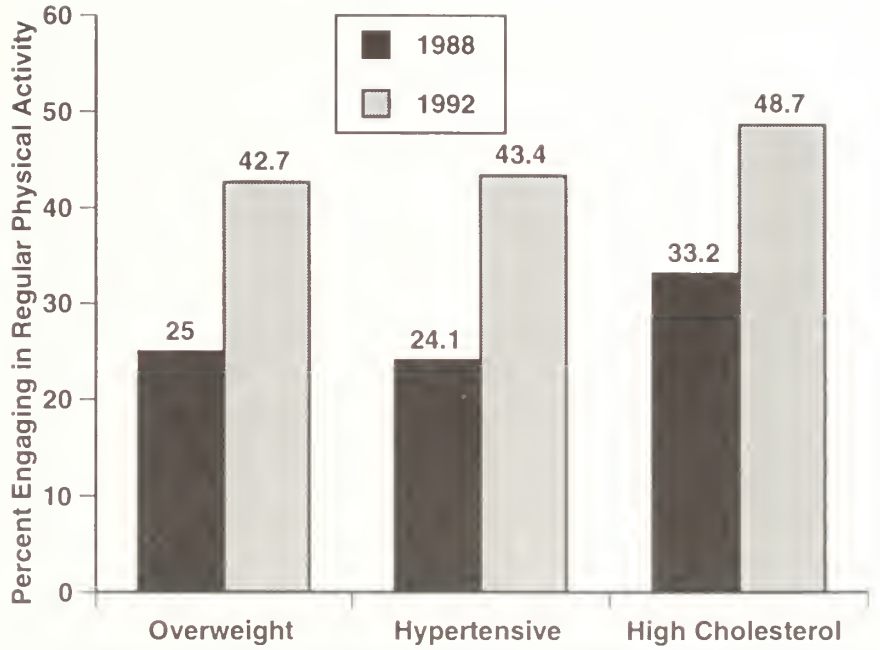

Fig 1.—Exercise among Rhode Islanders 18 years and older with risk for cardiovascular disease, 1988 and 1992.

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The Pawtucket Heart Health Program: Progress in Promoting Health

Richard A. Carleton, MD, Thomas M. Lasater, PhD,
Annlouise R. Assaf, PhD,
and the Pawtucket Heart Health Program Writing Group

Preliminary analyses suggest that the city of Pawtucket underwent a significantly greater decline in projected cardiovascular risk during the peak of intervention than did the comparison (control) population.

The Pawtucket Heart Health Program (PHHP) began in 1980 as a research project designed to test the hypothesis that cardiovascular risk factors and cardiovascular disease rates can be changed in entire community by encouraging its members to adopt healthier behaviors.[1]

The PHHP was designed to influence eating behaviors and, thereby, to influence blood cholesterol, blood pressure, and obesity rates. Similarly, the PHHP sought to inhibit the adoption of the smoking habit and to facilitate cessation of smoking throughout the population. Regular physical exercise was encouraged to improve cardiovascular fitness. Increased awareness, detection, and management of high blood pressure was sought through multiple public and health professional channels. In essence, the goal was to learn how to improve the cardiovascular risk profile of an entire free living population. The quasi-experimental design of the Pawtucket Heart Health Program required a comparison or control population. Accordingly, an anonymous, socio-demographically similar city was chosen from the many in southeastern New England.

Important early activities included the development of an elaborate plan for evaluating the outcome of this complex population-based experiment. Three broad types of evaluative strategies were developed. The first was to provide a means of tracking the process of education within the city.[2–4] A computer-based system was developed that recorded every individual who entered into an activity with the PHHP, the nature of that program, the channel or organization through which the individual was reached, and, often, the short-term outcome in terms of new knowledge, new behaviors, or risk factor changes. This formative-and-process evaluation system (FP Base)[1,2] has subsequently been adopted by many other population-based health promotion projects throughout the country and in other parts of the world. The FP Base system has provided the database for many publications describing work-in-progress of the program.

... Pawtucket physicians are well ahead of national physician behavior standards with reference to the clinically important cholesterol issues.

The second evaluative strategy was designed to measure trends in cardiovascular risk factors over time in Pawtucket citizens and in the comparison population. The carefully designed Health Survey, with a rigorous protocol, began in 1981.[5] Individuals were contacted at random in their households for a 35-minute interview to learn about knowledge, attitudes and behaviors. Blood pressure, height and weight, total cholesterol and HDL-cholesterol levels were measured. This survey was repeated approximately every 2 years for the next 12 years.

The third evaluation task was to develop and implement a system that permitted detection and verification of each myocardial infarction, fatal coronary heart disease, and fatal or nonfatal cerebral vascular accident that occurred in each city before, during, and after the education program in Pawtucket. This was accomplished through a morbidity and mortality surveillance system, involving record review in nine hospitals as well as review of all deaths as recorded by departments of health.

Many activities have been carried out by PHHP. Many lessons have been learned. Many contributions have been made. The process is ongoing. The present report constitutes an update to the physicians of Rhode Island concerning Pawtucket Heart Health Program.[1]

Community-Based Education Program

The educational program itself was applied broadly to the people of Pawtucket. This included both residents and those who visited or worked in the city. The theoretical basis of the educational program was derived from social learning theory described by Dr Albert Bandura.[6,7] An important focus was to move beyond a series of individuals to involvement of groups, organizations, and to provide access for the entire community.[8] In turn, it was anticipated that the cultural environment supportive of health promotive behaviors would increase and that support for unhealthy behaviors would decrease throughout the community.

An important element of the community activation approach was the professional training delivered to more than 3,600 volunteers who, in turn, became important components of the program delivery system.[9] Special training, certification, and supervision procedures ensured a high level of competence in these able volunteers.[10] Vol-

ABBREVIATIONS USED
DRG: Diagnosis related groups
FP Base: Formative-and-process evaluation system
HDL: High density lipoprotein
ICD: International Classification of Diseases
PHHP: Pawtucket Heart Health Program
SCORE: Screening, Counseling and Referral Event

The Pawtucket Heart Health Program, Division of Health Education, Memorial Hospital of RI, and departments of Medicine and Community Health, Brown University School of Medicine. Dr Carleton is professor of medicine, Brown University, and director of the Division of Health Education, Memorial Hospital of RI. Dr Lasater is professor of community health, Brown University, and associate director of the Division of Health Education, Memorial Hospital of RI. Dr Assaf is associate professor of community health, Brown University, and principal investigator of the Women's Health Initiative. *Funded, in part, by Grant HL23629 from the National Heart, Lung and Blood Institute, US Department of Health and Human Services.*

unteers represented relevant role models for participants. Volunteers led small behavior change groups, coordinated church-based health promotion programs,[11] screened for risk factors, and provided counseling and referral.[12] An eager, capable volunteer pool also provided cost-effective extenders for the professional staff.

More than 500 organizations were involved. As an example, a campaign strategy was developed for weight loss programs at work sites. This program, entitled "Lighten-Up," proved highly cost effective with one campaign involving 22 companies, 512 employees, and a total weight loss of 1,818 pounds. The cost was a modest 81 cents per pound lost.[13]

It was anticipated that the cultural environment supportive of health promotive behaviors would increase and that support for unhealthy behaviors would decrease throughout the community.

Churches and social clubs provided access to different segments of the population. Supermarkets and restaurants were important elements in the environmental-change process. The selection of healthy foods from restaurant menus was enhanced by promotion not only of the health promotive characteristics of menu entries but also the "good taste" attribute of these foods.[14] Shelf labels highlighted foods in grocery stores lower in fat content, sodium, and cholesterol.[15] Exit surveys of store customers showed that the labels influenced purchases.

All 27 public and parochial schools were actively involved, both as organizations employing teachers, and as educational institutions serving children. Innovative curricula were developed and delivered for grades 1, 3, 4, 5, 6, 9 and 11,[16] involving more than 10,000 students. One approach helped children understand the influence of peer pressure and advertising to get them to start smoking.[17] The program used this knowledge as a means of inhibiting onset of the smoking habit. School-based nutrition education was also an important target of the program activities.[18] A program delivered by home economics teachers was the Heart Health Cook-off. In this program, students identified their favorite recipes, analyzed the recipes with the help of computer software, modified the recipes to health promotive nutrient content profiles, prepared the food, and presented the food for judgment by a panel of school officials.[19]

Many community-wide programs proved popular. One called "Exercity and carried out in collaboration with the Pawtucket Parks and Recreations Department enrolled many individuals in enjoyable aerobics classes each year. The Exercity program also offered quit smoking and weight control programs.

Two different types of community-wide smoking cessation contests were developed and delivered. The most successful one, known as "Quit and Win," recruited smokers from throughout the city to enter a lottery. If they were successful in quitting, they became eligible to win a prize. This cost-effective approach produced quit smoking rates of over 20% in most replications of the program.[20,21]

The Pawtucket "Weigh-In" was another popular community-wide program. In one pilot study of this self-help program, 129 individuals decreased their weight by an average of 8.2 lbs. over the 10 weeks of the program. The mean blood cholesterol level fell by 29 mg/dl.[22]

A series of programs called "SCORE" (Screening, COunseling and Referral Event) proved to be a valuable approach to health promotion at the community level. This concept was applied extensively with blood cholesterol (using micro-chemistry technology) and blood pressure in many worksites and at the community level.[23,24] More than 20,000 people had their cholesterol measured, received dietary counseling using a simplified eating pattern assessment tool,[25] and, when appropriate, referral into the health care system because of elevated blood cholesterol. SCOREs held at churches or housing projects tended to attract women, while worksites proved to be an excellent location for influencing men. Younger participants were more likely to be seen in the worksite, while older adults were more frequently seen at community-based SCOREs. The yield of individuals with a cholesterol level above a desirable value often exceeded 50%, suggesting selective use of the screening opportunity by citizens who had reason to believe their cholesterol level was elevated.[26]

The formative and process tracking system provided opportunity to characterize the individuals who were most likely to participate in various programs.[27] For example, exercise programs, as expected, had nearly 60% of their participants derived from the 18–39 year age group and fewer than 20% age 60 and above. Conversely, blood pressure screening and referral events had nearly 40% of participants in the older age bracket.

The cumulative number of active participants in the program from the beginning of the educational effort in late 1983 through 1990 exceeded 40,000 individuals. This number did not include children in school-based programs or individuals encountering environmental-change programs such as those in restaurants, grocery stores, or as part of the many other activities designed to alter the environment throughout the city. Over 3,500 individual SCOREs were carried out. There were over 120,000 contacts between individuals and PHHP, indicating that, on average, each of the 40,000 individuals participating in the program contacted the program on three separate occasions.

Special programs were developed to influence physician practices.[28-30] Focused continuing medical education efforts were devoted to nutrition and to management of elevated cholesterol and other dislipidemias. Frequent updates on national guidelines for management of high blood pressure were provided. A combination of continuing medical education and the broad public education effort significantly and favorably modified the attitudes and behaviors of Pawtucket physicians concerning cholesterol and the therapy of elevated blood cholesterol in comparison to physicians of another similar community.[31] Indeed, Pawtucket physicians were well ahead of national physician behavior with reference to the clinically important cholesterol issues.

Health Surveys

The program carried out six biennial cross sectional surveys from 1981 to 1993. Each survey involved over 1,000 randomly selected individuals ages 18 through 64 in Pawtucket and in the control population. Thus, more than 15,000 individuals were surveyed and examined in their households.

Volunteers played many key roles in diverse activities, ranging from leader of small behavior change groups through coordination of church-based health promotion programs.

These survey data constitute a valuable epidemiologic resource for investigators in the years to come. The sampling process used in these surveys constituted an advance in survey methodology.[32] Many other valuable contributions to the epidemiological literature have occurred.[33-35] Data from the health survey, for example, have clearly shown a strong negative association between the level of educational attainment in the population and the composite risk of coronary heart disease. These educational

differentials were particularly notable in body mass index, a measure of adiposity, and in both total and HDL-cholesterol for middle aged women. For both males and females, smoking was strongly and negatively associated with educational attainment.[36]

The selection of health foods from restaurant menus was enhanced by promotion, not only of the health promotive characteristics of menu entries, but also the "good taste" attribute of these foods.

The availability of detailed dietary information using the Willet questionnaire has made possible many analyses of the dietary habits of people in these two cities. Analyses of the population by smoking status indicates that smokers not only have an augmented risk of cardiovascular disease because of their smoking habit, but also that they tend to consume more total energy, more fat, more alcohol, and more caffeine. On the other hand, smoking status was inversely associated with intake of Vitamins A and C, dietary fiber, folate, and iron, particularly among women.[37]

An important element of the health survey has been the ascertainment of all medications consumed by respondents, using direct review of all medication bottles in the home. This has provided a unique pharmocoepidemiologic database on over 15,000 randomly selected New England adults spanning the decade of the 1980s.[38] The database has been an important resource to researchers and has permitted close collaboration between investigators from multiple institutions within Rhode Island. It has permitted documentation of the striking trends in hypertensive medications during the 1980s. Downward trends in the use of diuretics and betablockers has been paralleled by sharply increased use of angiotension converting enzyme inhibitors and calcium channel blocking agents.[39] The database has also permitted careful analyses of the cardiovascular risk characteristics of women who do use estrogen after menopause and those who do not. The results of this observational study clearly indicate that women who have chosen to use post menopausal hormone replacement are less likely to be smokers, more likely to be physically active, and more likely to be lean.[40] This very different health profile reinforces the important uncertainty about the risks and benefits of post menopausal hormone replacement therapy. These data have also been useful in planning and guiding the clinical trial now underway in Rhode Island known as the Women's Health Initiative. (To help your patients participate, have them call 1-800-RI BEGIN.)

Morbidity and Mortality Surveillance

In collaboration with investigators at Stanford University and the University of Minnesota, the program has developed a thorough system for ascertaining the rates of myocardial infarction, fatal coronary heart disease, and stroke in the Pawtucket population and in the comparison population. All death certificates are reviewed. All hospital records with appropriate International Classification of Diseases (ICD) codes are abstracted. An epidemiologic diagnostic set of algorithms are then applied to determine whether or not an event of interest occurred. This system has proved to be robust from an epidemiologic standpoint, and cost effective from a research standpoint.[41] This system has also permitted analyses of the impact of the prospective payment system involving diagnosis related groups (DRG) on hospital discharge code assignment.[42] Upon the inception of the prospective payment system, it appears that individuals were more likely to be discharged with ICD-9 codes indicating an acute (code 410 or 411) rather than a chronic (codes 412-414) form of coronary heart disease.

Progress Report

The distal outcomes of the Pawtucket Heart Health program research model are changes in risk factors, changes in projected disease risk, and changes in the rates of morbid and mortal events. Data from the health surveys and from the morbidity and mortality surveillance system are currently undergoing final analyses. The health survey results are likely to be published during 1995; the surveillance system results are anticipated in the following year. Preliminary analyses suggest that the city of Pawtucket had a significantly greater decline in projected cardiovascular risk during the peak of intervention than did the comparison population.[43] It is clear, however, that many other factors influence risky behaviors and the cardiovascular risk profile of citizens of both cities. These changes appear to reflect, in part, secular trends affecting the entire nation. Smoking rates are declining throughout the country. There is a general, gradual decline in cholesterol levels, reflecting altered eating patterns. Control of high blood pressure has improved over the past 20 years. There is, unfortunately, an increased prevalence of obesity in many age groups and in both genders. The results of the Pawtucket Heart Health Program suggest that health programs targeting cardiovascular disease risk will have enhanced effectiveness if behaviors and the social and policy environment pertaining to risk factors are addressed simultaneously at the community, state, and national level.

Data from the health survey . . . have clearly shown a strong negative association between the level of educational attainment in the population and the composite risk of coronary heart disease.

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The Hidden Effects of Antihypertensive and Lipid-Lowering Agents on the Prevention and Regression of Atherogenesis: New Management Strategies

Marc S. Weinberg, MD, FACP

Both elevated lipids and high blood pressure have similar effects on the pathophysiologic mechanisms and interactions between endothelial cells, platelets, release of vasoactive proteins, transport process, and release of mediators of inflammation.

Cardiovascular disease is the leading cause of death in the Western world, accounting for half of all deaths. About 1 million people die each year as a result of cardiovascular diseases, such as heart attacks, strokes, arrhythmias, and sudden death. In the United States alone, some 60 million people have elevated blood pressure and another 40 million have elevated cholesterol. Recently, the focus of much research has been to investigate how preventive modalities can, at this time, attenuate, and in the future, ameliorate major manifestations of cardiovascular disease.

During the past 20 years, we have obtained a greater understanding of the risk factors contributing to atherogenesis. Specifically, risk factors for coronary artery disease (CAD) include elevated total cholesterol and other alterations in lipid levels, smoking, hypertension, diabetes mellitus, obesity, left ventricular hypertrophy (LVH), a sedentary lifestyle, and a strong positive family history of CAD. Furthermore, the Framingham Heart Study showed us several years ago that, for a man between the age of 30 and 40 years, for every 10 mg% drop in cholesterol, six months are added to a subject's life, and the chance of a heart attack is lowered by 20%.

Of particular interest has been the link between hypertension and hyperlipidemia. Both elevated lipids and high blood pressure have similar effects on the pathophysiologic mechanisms and interactions between the endothelial cells, platelets, release of vasoactive proteins, transport process, and release of mediators of inflammation. These observations demonstrate the many complicated factors that overlap along with striking similarities in both mechanisms by which high blood pressure and elevated lipids play key roles in initiating the atherogenic process.

Prevention, through lifestyle changes, has become a top priority in the overall fight against atherosclerosis. Indeed, changing the status of risk factors can save hundreds of thousands of lives and significantly impact the burden on our healthcare system. Moreover, identifying and controlling these factors is now possible, partly due to the integration of laboratory and radiographic computer technology in the diagnostic arsenal available to physicians, healthcare facilities, and the public.

Of all risk factors, elevated blood pressure and plasma lipids are most associated with an increased risk for CAD in both men and women. Elevated blood pressure results in arrhythmias, angina, sudden death, increased platelet aggregation, myocardial infarction, increased cortisol and catecholamines, and alpha sympathetic stimulation. Elevated cholesterol, lipoproteins, and apolipoproteins are major factors in the pathogenesis of CAD. And since blood pressure control can diminish the risk of some cardiac events, clinical researchers have investigated the effects of both blood pressure and lipid-lowering agents in both human and animal models.

This paper summarizes the effects of blood pressure control agents (ACE inhibitors and calcium-channel blockers and lipid-lowering agents, HMGCoA reductase inhibitors) on atherogenesis in animal and human studies. These therapeutic agents are significant in that they modify the effects of cardiovascular disease on the blood vessel wall. The goal is to help patients benefit from these results and extend life by understanding the complex interactions among risk factors, while also adjusting management strategies.

Epidemiological Studies

For decades, insurance companies have generated statistics demonstrating that the incidence of CAD is directly proportional to high blood pressure and high cholesterol. Subsequently, several epidemiological studies have demonstrated the relationship between various risk factors and CAD. Results are summarized below.

The Framingham Heart Study (FHS), the longest and most comprehensive epide-

ABBREVIATIONS USED

ACE: Angiotensin converting enzyme (inhibitors)
CAD: Coronary artery disease
CCAIT: Canadian Coronary Atherosclerosis Intervention Trial
CLAS: Cholesterol Lowering Atherosclerosis Study
EDRF: Endothelial Derived Relaxation Factor
EKG: Electrocardiogram
FATS: Familial Atherosclerosis Treatment Study
HIS: Framingham Heart Study
HALT: Hypertension and Lipid Lowering Trial
HCTZ: Hydrochlorothiazide
HDL: High density lipoprotein
HMGCoA: 3-hydroxy-3-methylglutaryl coenzyme A
INTACT: International Nifedipine Trial on Antiatherosclerotic Therapy
LDL: Low density lipoprotein
LVH: Left ventricular hypertrophy
MARS: Monitored Atherosclerosis Regression Study
MIDAS: Multicenter Isradipine/ Diuretic Atherosclerotic Study
MRFIT: Multiple Risk Factor Intervention Trial
PLAC I: Pravastatin Limitation of Atherosclerosis in Coronary Arteries
QUIET: Q.uinapril Isehemic Event Trial
TI-IS: Tecumseh Hypertension Study
WHHL: Watanabe heritable hyperlipidemic (rabbit)

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miology heart study, showed that the aggregate risk of high cholesterol, systolic blood pressure, glucose intolerance, cigarettes, and left ventricular hypertrophy (LVH) are significant in developing CAD.

The Tecumseh Hypertension Study (THS) investigated the association between borderline hypertension and the development of sustained hypertension and ischemic heart disease. Studying groups of patients with different "clusters" of risk factors (normotensive with normal weight, normotensive with obesity, borderline high blood pressure with obesity) researchers demonstrated that borderline hypertension early in life with obesity are predictors of sustained hypertension in adulthood. Researchers also found several metabolic abnormalities to be predictors of ischemic heart disease, including dyslipidemia and diabetes. Thus, the "clustering" of risk factors identifies those subjects with the greatest need for aggressive management.

The Multiple Risk Factor Intervention Trial (MRFIT) study showed that cigarettes, blood pressure, cholesterol, and LVH are all additive risk factors for CAD. In fact, the subset of patients who did worst had EKG abnormalities, LVH, and high blood pressure. Furthermore, LVH is seen almost exclusively in hypertensive patients, and is the most severe and ominous risk factor predicting sudden death. Adjusted relative risks showed that, for every 10 year-increment in age, there was a large increase in the risk of CAD.

... borderline hypertension early in life with obesity are predictors of sustained hypertension in adulthood.

The Gotenberg Study (Sweden) showed that blood pressure and cholesterol reduction are synergistic. These human findings support animal results discussed by Chobanian.[1] Cholesterol reduction in the absence of blood pressure reduction resulted in only a small decrease in CAD risk; the converse yielded similar results.

The Oslo Heart Study showed a significant decrease in CAD in previously healthy men through two combined interventions: reduced smoking and lowering serum cholesterol with dietary changes.

ACE Inhibitors

Chobanian[1] investigated the effect of ACE inhibitors on the incidence of atherosclerosis in various sites around the descending and ascending thoracic and abdominal aorta of the Watanabe heritable hyperlipidemic (WHHL) rabbit. Using normotensive WHHL rabbits treated with 50 mg/kg/day captopril, Chobanian found that atherosclerotic plaques in the captopril group were thinner and less cellular than those of similar gross severity in controls, suggesting that captopril can inhibit atherogenesis. Moreover, thoracic aorta tissues contained 60% less cholesterol and had lower blood pressure than controls. Chobanian hypothesized that captopril reduced the growth and proliferation of vascular cells. In fact, the thickness of the aortic wall in the captopril-treated rabbits appeared thinner than in controls, perhaps partly due to reduced blood pressure and resultant decreased wall tension. Chobanian further speculated that lower blood pressure might reduce arterial permeability and decrease lipoprotein entry into the intima or even enhance cholesterol removal from there.

Chobanian also investigated the antiatherosclerotic effect of trandolapril, a nonsulfhydryl-containing ACE inhibitor (unlike captopril) on the WHHL rabbit using a similar protocol. Trandolapril produced similar results as captopril, suggesting that the antiatherosclerotic effect of both agents may be a class effect relating to ACE inhibition.[1]

Other researchers investigated still another ACE inhibitor, perindopril, on cholesterol-fed rabbits.[2] At low doses, perindopril reduced mean arterial blood pressure by 13%. Perindopril appeared to have a direct effect on the biology of the arterial wall by decreasing the severity of atherosclerosis, particularly in increasing collagen synthesis by smooth muscle cells and decreasing their binding and uptake of atherogenic lipoprotein. The 0.3 mg/kg/day perindopril dosage decreased the percentage surface area covered by plaque in the descending thoracic aorta by 80%, an effect that is considerably greater than that reported for the much higher doses of captopril (50 mg/kg/day) in both the WHHL rabbit (about 60%) and the cholesterol-fed monkey (about 30%).

Encouraged by these results, investigators moved on to human subjects. The Quinapril Ischemic Event Trial (QUIET) tested the ACE inhibitor, quinapril, to assess the long-term effects of ACE inhibition on the natural history of CAD in a population with normal lipid levels and without ventricular dysfunction, as seen in clinical end points and angiographic results. To date, enrollment is complete; the trial is expected to last until the end of 1995. If the ischemic event rate is reduced, quinapril can be considered as both a secondary and perhaps even a primary preventive agent against CAD.[3] In a review article by Weinberg, ACE inhibitors have been demonstrated to significantly reduce cardiovascular mortality in subjects with congestive heart failure, regardless of blood pressure or lipid levels.[4] ACE inhibitors function as "cardioprotective" agents in congestive heart failure; furthermore, they act as "renoprotective" agents by attenuating the progression to chronic renal failure in various clinical syndromes of renal diseases, such as diabetic nephropathy. We believe these physiologic effects on blood vessel walls may indeed be "blood vessel protective," thus justifying their importance as agents to lessen the risk of cardiovascular disease, as discussed in this paper.

Calcium-Channel Blockers

Most of the animal data on calcium-channel blockers come from cholesterol-fed rabbits. Atherogenesis in rabbits is influenced by several factors. The dihydropyridines (nifedipine, nicardipine, isradipine, nisoldipine, and nilvadipine) both prevent and cause regression of atherosclerosis.[5] Isradipine partially reverses endothelial dysfunction associated with hypercholesterolemia in cholesterol-fed rabbits. Nifedipine-treated rabbits had both *significantly fewer lesions* in the surface of the aortic intima and *significantly less cholesterol* in those lesions, compared to controls. Nifedipine has also been shown to suppress atherogenesis in monkeys, a model more similar to humans.

At least three major studies have been conducted on human subjects, all of which indicate a favorable class effect on atherogenesis. Results are consistent with animal studies. However, the lack of correlation in the prevention and regression of both new and old atherosclerotic lesions in humans and animals can not be explained from the research data available. Clearly, the pathophysiologic findings support speculations, but more studies are necessary.

Cholesterol reduction in the absence of blood pressure reduction resulted in only a small decrease in coronary artery disease risk.

The Montreal Heart Institute Trial sought to determine whether chronic treatment with nicardipine could influence the progression of coronary atherosclerosis.[6] Results from coronary angiography performed at baseline, 2, and 4 years later demonstrated that nicardipine did not influence the rate of progression or regression of advanced atherosclerosis; however, treated patients did show less progression of minimal lesions, suggesting that nicardipine may prevent or retard development of early lesions. This

finding is clinically significant because minimal lesions progress to coronary events later on, and ultimately lead to a poor prognosis.

The International Nifedipine Trial on Antiatherosclerotic Therapy (INTACT)[5,6] sought to assess whether nifedipine retard-

ACE inhibitors . . . significantly reduce cardiovascular mortality in subjects with congestive heart failure, regardless of blood pressure or lipid levels.

ed the progression of coronary atherosclerosis, using angiographic assessment. Researchers were pleased that human results were consistent with cholesterol-fed rabbit results: nifedipine showed a marked effect on early lipid-rich lesions, rather than on the overall progression or regression of preexisting, advanced stenotic lesions.

The Multicenter Isradipine/Diuretic Atherosclerotic Study (MIDAS) is seeking to establish the efficacy of isradipine vs. the diuretic hydrochlorothiazide (HCTZ) in inhibiting atherogenesis and retarding the progress of atherogenesis in carotid arteries of hypertensive patients.[7] The primary end point is the thickness of the intima-media and the extent of atherosclerotic plaque, as assessed by non-invasive B-mode ultrasonography, a vast improvement over previous technology. The carotid was chosen over the coronary artery because of the noninvasive nature of the examination method, its lower cost and greater safety, and because previous studies found a strong relationship between carotid artery atherosclerosis and CAD.[7] MIDAS study results are expected to confirm the antiatherosclerotic effect of isradipine found in animal models, one that will have significant implications on the use of this agent in the management of CAD. Coronary angiography, a diagnostic technique for 25 years, was used throughout to assess the extent of arterial stenosis. An angiogram is a two-dimensional shadowgram of an opacified vessel that demonstrates the effect of arterial wall disease on the contour of the lumen. Evaluation of the progression or regression of atherosclerotic lesions is based on the assumption that a change in plaque volume will affect the size and shape of the contrast-enhanced lumen.

Arterial lesions vary in obstruction, distribution, and pathological composition; most yield circular, elliptical, or D-shaped lumens. Routine coronary angiography frequently underestimates the severity of arterial lesions, even missing significant obstruction to the lumen. Despite this limitation (as well as sources of error from the patient, technique, or methodology) quantitative computerized coronary angiographic methodology is currently the definitive procedure for assessing progression and regression of coronary atherosclerosis in humans and animal models, demonstrating changes in luminal diameter <5%.

HMGCoA Reductase Inhibitors

The 3-hydroxy-3-methylglutaryl coenzyme A (HMG-CoA) reductase inhibitors (pravastatin, lovastatin, simvastatin, fluvastatin), a new class of lipid-lowering agents that have become popular because of their efficacy and low incidence of adverse effects, are thought to retard the progression or facilitate the regression of atherosclerosis, as assessed by angiography.[8]

The Canadian Coronary Atherosclerosis Intervention Trial (CCAIT) used lovastatin. The CCAIT results indicate that lovastatin alone slows the progression of coronary atherosclerosis and reduces the development of new coronary lesions in a diverse population of coronary disease patients. This effect was most clearly observed in the more numerous, milder lesions and in patients whose baseline total or LDL cholesterol levels were above the median for the entire group. The ability of lovastatin to prevent the formation of new coronary lesions may be more important than its effect on established lesions, since the risk of an event increases with an increasing number of lesions. Moreover, an early lesion containing high lipid content and a thin fibrous cap is most likely to lead to an acute coronary event.[8]

In the Monitored Atherosclerosis Regression Study (MARS), lovastatin was used to assess the effects of lipid-lowering therapy on patients with CAD, and to compare the findings with those of two lipid-lowering trials using similar end points.[9] The MARS study is the first angiographic trial to test the effects of monotherapy with an HMG-CoA reductase inhibitor on coronary artery lesions. The MARS results demonstrated that treatment with lovastatin plus diet slows the rate of progression and increases the frequency of regression in coronary artery lesions, expecially in more severe ones.

In the Familial Atherosclerosis Treatment Study (FATS), CAD regression was observed in about 30% to 40% of patients treated with aggressive lovastatin therapy. Clinical events were significantly fewer, drug treatment was well tolerated with few adverse effects, and patients with clinical events had higher lipoprotein (a) than those who without events.[10]

The Pravastatin Limitation of Atherosclerosis in the Coronary Arteries (PLAC I) trial sought to evaluate the effects of monotherapy with pravastatin on the progression and regression of CAD, as measured by quantitative angiography, and to evaluate the same in patients with only moderate increases of low-density lipoprotein (LDL) cholesterol, which typifies patients with symptomatic CAD. The PLAC I results will soon be published.[11] Simvastatin and fluvastatin are also being investigated and are expected to yield similar results.

It is noteworthy that a study using lipid-modifying agents different from HMG-CoA reductase inhibitors also demonstrated consistent results. The Cholesterol Lowering Atherosclerosis Study (CLAS) investigated the effect of cholestipol and nicotinic acid on coronary atherosclerosis. Coronary angiographic results demonstrated that progression was retarded and regression accelerated in the lipid-modifying group.

The Effect of Controlling Blood Pressure Plasma Lipids in the Development of Atherogenesis in the Arterial Wall

Sufficient data exist to confirm that atherogenesis is a multifactorial process. The antiatherosclerosis effect[12] exhibited by calcium-channel blockers in animals is due partly to the preservation of endothelial function and partly to inhibition of platelet aggregation, migration of monocytes and smooth muscle cells into the intima, incorporation of LDL into these cells, matrix formation, and calcium overload in atherosclerotic lesions. Calcium is itself involved in the migration and proliferation of smooth muscle cells, secretion of connective tissue,

. . . treatment with lovastatin plus diet slows the progression and increases the frequency of regression in coronary artery lesions, especially in more severe ones.

calcification, and necrosis—all of which are intrinsic to atherogenesis. Furthermore, as calcium enters the calcium channel within the blood vessel wall, vasospasm occurs and the mediators of inflammation are released. This is, in fact, another preventive mechanism inhibited by calcium channel blockers.

The ACE inhibitors have been demonstrated to mimic the atherogenic process in animals and humans. Many scientists believe their major effect is through inhibition of angiotensin II, a potent blood vessel growth agent. Angiotensin II induces both hypertrophy and hyperplasia in arterial smooth muscle cells. Preventing angiotensin

II's tissue growth-promoting effects through converting-enzyme inhibition may contribute to prevention of atherogenesis. Reducing blood pressure, a major effect of ACE inhibitors, might contribute to the antiatherogenic effect by preserving the endothelial barrier, reducing arterial permeability and lipoprotein entry, and reducing the release of normal and abnormal peptides and growth-promoting factors from the dysfunctional endothelium (EDRF, endothelin, kinins, kallikrein, prostaglandins, renin).[13]

The alpha-1 blocker, doxazosin, has been shown to reduce blood pressure, while successfully increasing HDL (good cholesterol) and reducing both total cholesterol and LDL (bad cholesterol). This very promising agent induces a 3% to 5% change in human cholesterol levels, while normalizing blood pressure. Our research laboratory participated in the HALT consensus trial, also proving the same. Therefore, these agents will play an important role in the future management and treatment of blood pressure and lipid control.

The HMG-CoA reductase inhibitors, by inhibiting LDL formation, reduce binding at the LDL endothelial cell receptor. This occurrence leads to an age reduction and migration of both macrophages, which later become laden with LDL, developing into foam cells, monophages, and mediators of inflammation, such as elastin and collagen into the intima and media of the blood vessel wall. One could speculate less platelet and endothelial aggregation and interaction as well as less transport through the calcium channel.

Despite the research summarized in this paper, we are just beginning to explore the pathogenesis of atheroclerosis. What is interesting and exciting is the preventive and regressive effect on new atherosclerotic lesions exerted by agents traditionally used for other purposes, ie, lowering blood pressure. As clinical trial data becomes more available and carefully scrutinized, our understanding of atherogenesis will deepen, and with keener insight, we will be poised to apply innovative management strategies in the fight against this leading killer in the Western world.

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The Physician's Challenge in Tobacco Control

Judith D. DePue, EdD, MPH, Judith R. Miller, PhD,
Michael G. Goldstein, MD

To improve our effectiveness in fighting heart disease, cancer and other tobacco-related illnesses, new strategies are needed to combat tobacco use.

There are almost 2000 deaths each year in Rhode Island attributable to smoking.[1] It is estimated that one-fifth of deaths due to cardiovascular disease are attributable to smoking.[2] Cigarette smoking also contributes to cardiovascular and respiratory morbidity, and to extensive medical costs and lost productivity. In 1993, direct medical costs in the US associated with smoking totaled $50 billion.[3] The most useful medical advice physicians can give to their smoking patients is to say, "Quitting smoking is the most important thing you can do for your health." Quitting smoking is many times more effective in reducing heart disease risk than dietary changes.[4] Physician advice and counseling is effective in increasing smokers' quit rates,[5] yet many physicians feel frustrated with counseling individual patients because few smokers are ready to quit. In Rhode Island, approximately 25% of adults are smokers and 20% of high school seniors have smoked at least 100 cigarettes and continue to use tobacco daily.[1] To improve our effectiveness in fighting heart disease, cancer, and other tobacco-related illnesses, new strategies are needed to combat tobacco use.

This article will describe several opportunities on individual, office, and community levels for physicians to increase their effectiveness as tobacco control advocates. Physicians may advocate for the health of individual smokers and their families by helping their patients quit smoking. They may also create an office environment that further supports their cause, by enforcing a no-smoking policy, and by displaying posters and brochures that decry tobacco's effects. Advocacy may also involve working on the local, state, or national levels to educate others to change social and environmental conditions that promote smoking.

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Why Physician Advocates are Needed

Although tobacco use is on the decline among some groups, it is still widely used by others. Among roofers, bricklayers, and bartenders, the rate exceeds 50%.[6] Smoking prevalence varies by race. In Rhode Island, the 1991 Behavioral Risk Factor Survey found that 24% of white adults smoke and 27% of blacks and hispanics smoke (unpublished data). Tobacco use is expensive. Based on 1992 tax receipts, Rhode Islanders spent over $36 million. The social costs of using this product is almost $300 per person, the highest in the nation. Reducing tobacco use by Rhode islanders is the single most effective way to reduce the state's illness burden.

Reducing tobacco use requires an understanding of the formidable influence of tobacco in our society. The tobacco industry continues to change its tactics to counteract any gains made by health organizations and legislative efforts.[8,9] Each year, the tobacco industry spends $4 billion to advertise and promote its products,[10] making it the most heavily advertised product in the country.[11] In spite of their arguments to the contrary, the effect of these expenditures is to encourage young people to use a product that promises glamour, social success, and independence, three most highly desired traits for young people. The most heavily advertised brands, Marlboro, Camels, and Newport, are the first ones used by young people.[12] If young people do not start smoking, prevalence rates will decline, because almost all adult smokers (90%) started using tobacco before age 20.[13]

Advocacy is needed to reduce the ubiquitous nature of advertising by creating limits on where and what kinds of advertising may be used. In 1988, Canada's Parliament banned tobacco advertising and promotion. There is no advertising in magazines and newspapers. The dollar value of billboards and transit posters was reduced one-third annually, and the remaining signs have strong health warnings. Advocacy is also needed to develop support for counter-advertising campaigns. Such campaigns were successful in dramatically reducing the number of smokers between 1967 and 1970, when health messages were broadcast on television to balance tobacco ads. When tobacco broadcast advertising and the counter-advertising were eliminated, the number of former smokers dropped dramatically.[14] Recently, California and Massachusetts have used tobacco excise taxes for extensive media campaigns on the nature of tobacco addiction, the role of the tobacco industry, the ill effects of tobacco use, and how to quit smoking. During the active periods of the campaigns, adult tobacco use has declined.[15]

In addition to restricting advertising and encouraging counter-advertising, advocates are needed to support clean indoor air legislation and legislation to reduce access to tobacco by young people. Rhode Island has strong legislation restricting tobacco use in many indoor locations. It is illegal to sell or give tobacco products to minors, but the law is often ignored. Advocates are needed to remind vendors of their responsibility and to file complaints with local police to insure enforcement. In the last session of the legislature, comprehensive youth access legislation was introduced, but did not pass. This issue will be reintroduced in the next legislative session. Strong public support is essential for meaningful legislation to pass.

The single factor that will lead to the most dramatic change in tobacco use is higher price. In Canada, the federal tobacco tax increased annually from 1983, when the cost per pack was $2.10, to 1992, when the cost per pack was $5.54. During this period, the prevalence of smoking declined from

Drs. DePue and Goldstein dedicate this article to Dr. Judith Miller who died December 16, 1994. This article is a fitting memorial to extend Judith's voice as a committed tobacco control advocate.

ABBREVIATION USED
ASSIST: American Stop Smoking Intervention Study

Table 1. A patient-centered approach to smoking cessation.

Address the Agenda
- Bring up the topic of smoking. "I'd like to talk to you about smoking."

Assess
- Readiness to quit smoking. "Are you intending to quit smoking in the next 6 months?"
- History of prior quit attempts
- Level of nicotine dependence
- Knowledge of health risks of smoking. "What do you know about the risks of continued smoking?"
- Feelings and concerns about quitting

Advise
- Provide information; correct misunderstandings.
- Personalize risk and benefits.
- Tell patient you would like him/her to stop smoking.

Assist

For all patients (especially those not ready to quit):
- Provide support: state willingness to help.
- State understandability of patient's feelings. "I know it's hard to quit smoking."
- Express optimism about chances for success.
- Identify barriers and solve problems.

For patients ready to quit:
- Negotiate a quit date.
- Provide resources, materials.
- Prescribe nicotine replacement when appropriate.

Arrange follow-up
- Schedule visit or phone call (whether or not the patient decided to quit).
- If the patient attempted to quit, review results.
- If the patient is not abstinent, encourage repeated attempts.
- Reinforce effort.

34% to 26% for persons age 15 and older. Even sharper declines were noted for persons between ages 15 and 19.[16] Similar, though less dramatic, results have been seen in California and Massachusetts. Advocacy is needed at both the state and national levels to raise the tobacco tax to discourage youth from starting to smoke and to encourage adults to quit. The Coalition on Smoking OR Health, made up of the American Heart Association, American Cancer Society, and American Lung Association, has calculated that a $2.00 per package cigarette excise tax would save a million lives by preventing youth from starting to smoke and reinforcing smokers' decisions to quit.

Improving Interventions with Individual Patients

Physicians have many excellent opportunities to influence individual smokers in their practice. More than 70% of smokers see a physician each year, and each smoker has an average of four visits per year.[17] Furthermore, patients who smoke are likely to come in with an acute or chronic medical problem that is related to their smoking. Such visits offer a "teachable moment" when patients may be most receptive to smoking interventions.

While most physicians recognize the importance of counseling smoking patients, few are consistent in this practice. In a Rhode Island population-based sample of 4296 smokers, of the 3377 smokers who reported having contact with a physician in the past year, only 51% reported that a physician or health care provider talked with them about smoking. Of these 1555 smokers, 89% reported that they were advised to quit, but only 29% reported that they were offered help in quitting.[18] There are many explanations for physicians' limited role in aiding patients to quit. Some physicians lack counseling skill, and others lack confidence that counseling will make a difference. Furthermore, patient counseling is not reimbursed. Organizational support and materials to aid physicians and patients in the smoking cessation effort may be lacking. Finally, many physicians believe that patients don't want to quit.[19,20,21] All of these barriers can be overcome by training in counseling skills, by motivational techniques such as tailoring messages to the patient's stage of readiness to quit, and by improving office organizational systems to support these interventions.

Research has shown that brief counseling, when done consistently with every smoker, is effective in improving smokers' quit rates.[22] Even brief physician advice alone more than doubles 1-year quit rates when compared to controls.[19] Physician training, use of educational materials, pharmacological aids, and follow-up further improve success rates.[5,19] The best outcomes result from interventions involving both physicians and nonphysicians, providing advice on multiple occasions, and using multiple modalities.[5]

A model for brief counseling in primary care setting is "the 5-A's,"[17] which is adapted from the National Cancer Institutes's physician intervention program (see Table 1).[23] These 5 steps can be used effectively in as little as 3minutes, and can be used with

Table 2.—Tobacco control activities beyond direct patient care.

Community
- Speak to children in schools. Contact the American Academy of Family Physicians, "Tar Wars" program, or American Heart Association, "Smoke-Free Class of 2000."
- Enforce tobacco-free schools and clean indoor air policies by filing complaints if you see violations.
- Remind sport team coaches and parents not to smoke at practices and games.
- Join your Substance Abuse Prevention Task Force's tobacco committee.
- Support local pharmacies who do not sell tobacco products.

State
- Participate in tobacco control committees of the American Heart Association/Rhode Island Affiliate, American Lung Association of Rhode Island, or the American Cancer Society/Rhode Island Division.
- Testify on behalf of good tobacco control legislation and against bills that would weaken current legislation.
- Encourage your state senators and representatives to strengthen tobacco control legislation.
- Join The Miriam Hospital/Project ASSIST Physician Advocacy Project to speak to professional and community groups about tobacco control.

National
- Encourage professional societies to address tobacco control by supporting legislation, programs, policies, services;
- Serve on the tobacco control committees of national organizations and societies;
- Withhold financial support for organizations that have been supported by tobacco industry money;
- Support a $2.00 per package cigarette excise tax; and
- Inform members of Congress of your tobacco control positions.

International
- Send letters of support to heart disease and tobacco control organizations in other countries
- Protest the sale and promotion of American tobacco products in Eastern Europe and Asia

every patient at every visit. Tailoring the counseling to the smoker's readiness to quit is important, not only to better meet the patient's needs, but also to allow the physician to set realistic intermediate goals. Thus, moving the patient along from not thinking about quitting to thinking about it is a measure of counseling success. Similarly, helping a patient to reframe a relapse as an opportunity to learn about powerful triggers should be considered a counseling success, as most smokers make several attempts before they eventually quit.

Counseling Children and Youth

Physicians must use every opportunity to deter tobacco use with their young patients. The counseling model described above can be adapted for children and youth who are not yet smoking or who may be experimenting with tobacco. The physician can assess the patient's risk for smoking by knowing whether the parents smoke and by asking how the patient feels about smoking and how he or she might handle pressures to smoke. Advice for a young patient includes a clear statement that tobacco is highly addictive and that not smoking is important to his or her appearance, health, growth, and development. Assistance involves discussing techniques to deal with pressures from peers and advertising. Arranging follow-up could involve saying you will ask them from time to time how they are feeling about smoking and reassuring them that you are interested in helping them not start or to quit if they should want help. For children who are already smoking regularly, helping them to consider a quit attempt should involve tailoring messages to children's values.

Office Level Advocacy

Patient counseling strategies are more likely to be effective if the office is set up in ways to help promote smoking interventions, as well as to advocate for tobacco control efforts. Examples of office-level approaches include:

1. Create a smoke free office; let patients know it is smoke free and why;
2. Restrict office magazines to those without tobacco advertising;
3. Use a reminder system to identify smokers and thus to prompt consistent counseling;
4. Maintain supplies of resource materials to assist patients who smoke;
5. Provide access to information about tobacco control advocacy efforts (eg, newsletters, posters);
6. Develop a follow-up system to contact smokers soon after a quit attempt with a letter, phone call, or visit;
7. Involve other staff in coordinating tobacco control efforts. Designating a staff person as coordinator may help insure that tobacco interventions are done with every smoking patient, that resource materials are on hand, and that follow-up is arranged. It is also important that tobacco control messages come from all staff with whom the patient is in contact.[5]

Table 3.—Tobacco control newsletters and journals.

Americans for Non-Smokers Rights (ANR), 2530 San Pablo Avenue, Suite J, Berkeley, CA 94702, (415)841-3032.

Smoking and Health Review. Action on Smoking and Health (ASH), 2013 H Street, NW, Washington, DC 20006, (202)659-4310.

Tobacco-Free Youth Reporter. Stop Teenage Addiction to Tobacco (STAT), 511 E. Columbus Avenue, Springfield, MA 01105, (413)732-7828.

Tobacco Control, An International Journal. C/o British Medical Journal, Box 560B, Kennebunkport, ME 04046.

World Smoking and Health. American Cancer Society, 1599 Clifton Road, NE, Atlanta, GA 30329-4251.

Influencing Tobacco Control on the Community Level

Counseling patients and having an office environment that encourages tobacco control are essential first steps in reducing tobacco use and improving health. Health professionals must also remind voters and legislators that tobacco control is a *health* issue. The tobacco industry is moving from its earlier tactic of disputing the relationship between tobacco use and heart disease, strokes, respiratory diseases, and cancers to one in which they emphasize individual rights.[24] The rights argument is very persuasive, but must not be allowed to detract from the importance of controlling the single most preventable risk factor for disease. Health professionals and their patients can make the most persuasive arguments to policy makers at all levels of government.

Table 2 gives examples of tobacco control activities through which health professionals can advocate for the cause of a tobacco free society.

Readers may ask if doing any of these things makes a difference. The answer is yes. When Geoff Berg, MD, a Providence internist, found that state law allowed tobacco use by persons 16 years of age and older, he took steps to have legislation introduced to raise the age to 18. The legislation passed. When "Doctors Ought to Care" encouraged readers of a Seattle newspaper to protest tobacco advertising, the paper changed its policy and refused tobacco advertising. With leadership from health care professionals and organizations, tobacco control efforts are more likely to succeed. There are a number of organizations that work exclusively on tobacco control. They provide information and inspiration to individuals interested in this cause (see Table 3).

In summary, physicians and other health care professionals have many opportunities to serve as advocates for tobacco control efforts. The opportunities begin at the indi-

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vidual patient level, where brief motivational and counseling interventions are effective in deferring tobacco use. Office level activities include developing systems to promote delivery of clinical interventions, establishing the office as a smoke-free environment, and providing messages and resources that promote tobacco control. At the community level, health professionals can educate the public about the importance of tobacco control, participate as members of local and national organizations engaged in tobacco control efforts, encourage other organizations to support tobacco control policies, testify at legislative hearings, and write to local and national government officials, among others. Interested physicians are invited to join the authors of this article on the Project ASSIST Physician Advocacy Project, which has been funded to provide physicians with training and resources to engage in tobacco control efforts. Whatever action you choose to take, you will be helping to reduce the single greatest preventable cause of heart disease.

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Increasing Physical Activity: The Issues

Paul D. Fadale, MD, Keith Glowacki, MD, Michael J. Hulstyn, MD

. . . 85% of adults say that a doctor's recommendation and advice on physical activity would help them get more involved in regular exercise.

Regular physical activity has many health benefits.[1] It increases life expectancy, helps older adults maintain more independence, and enhances the quality of life. Physical activity may help prevent coronary artery disease, mild hypertension, osteoporosis, obesity, non-insulin dependent diabetes, and depression.[2-6] It has also been associated with lower rates of colon cancer, stroke, and back injury.[7]

The relationship between physical activity and health is multifactorial. Vigorous physical activity will help promote cardiorespiratory fitness and prevent coronary artery disease. Exercise offers protection against injury and disability by building muscle strength, endurance, and flexibility. Activity is important in all weight control programs. Increasing physical activity can effect beneficial changes in blood pressure, lipids, clotting factors, and glucose tolerance, which can help prevent and control high blood pressure, coronary heart disease, and diabetes. Pursuing activities that result in energy expenditure may also produce physiologic changes that favorably affect blood pressure, platelet aggregation and fibrinolysis, and glucose tolerance, thereby helping to prevent or manage coronary heart disease and diabetes mellitus.

Despite the overwhelming evidence of the benefit of exercise, the majority of Americans remain sedentary. Therefore, increasing the proportion of people who engage in physical activity has been selected as one of the nation's Year 2000 Health Objectives.[8] In this vein, the governor of Rhode Island established the Governor's Council on Physical Fitness and Health, to promote physical activity in the state.

The Centers for Disease Control and Prevention characterize persons as sedentary if they perform no activity or physical activity done for 20 minutes or less, or fewer than 3 times per week.[9] In 1990 more than half of the adults in the United States could be characterized as sedentary. The median percentage among 45 states was 58%.[10] In 1991, the Rhode Island Behavioral Risk Factor Surveillance System conducted telephone interviews with about 1800 randomly selected Rhode Island adults. Information on health related behaviors and sociodemographics was obtained. Similar to other adults in this country, 55% of the Rhode Island respondents can be characterized as sedentary. Males under 25 years of age were less sedentary than others, while people over 74 years of age were more sedentary. Gender and physical activity did not appear to be related when age was controlled. People of greater educational attainment and people with higher incomes were less likely than others to lead sedentary lifestyles. This relationship, however, did not hold for the youngest (age 18-24) or oldest (age 75+) age groups.

Rhode Island has a high rate of cardiovascular disease, much of which could be prevented or delayed with increased exercise, decreased smoking, healthier diet, and control of high blood pressure and blood sugar. A review of 43 studies reveals that sedentary individuals are at almost twice the risk for coronary heart diseases as physically active individuals. Coronary artery disease, the leading cause of death in the US, is related almost as strongly to inactivity as by smoking and hypertension.[11]

Despite the public's knowledge of the positive effects of physical activity, only 22% of adults engage in leisure time activity at the levels recommended for health benefits (at least 30 minutes of light to moderate physical activity five or more times per week). Less than 10% of the population exercise three or more times per week at the more vigorous level needed to improve cardiorespiratory fitness. Increasing evidence, however, suggests that light to moderate physical activity, below the level recommended for cardiorespiratory fitness, can have significant health benefits. For those who are inactive, even relatively small increases in activity are associated with measurable health benefits. Light to moderate physical activity is more readily maintained than vigorous activity.

Every adult should accumulate 30 minutes or more of moderate intensity physical activity most days of the week.[12] Because most Americans do not meet this standard, almost all should strive to increase their participation in moderate or vigorous physical activity to improve health. The recommended 30 minutes may take the form of planned exercise such as aerobics, jogging, tennis, swimming, and cycling. Other activities can include walking upstairs instead of using the elevator, gardening, raking leaves, and walking part of or all of the way to or from work. Inactive individuals should gradually build up to 30 minutes, and those who are active on an irregular basis should strive to become more consistent. Regular participation in physical activities that develop and maintain muscular strength and joint flexibility are also recommended.

A quarter of a million deaths each year can be attributed to physical inactivity. A sedentary lifestyle is as important a risk factor as high blood pressure, obesity and smoking. Yet, today's high-tech society encourages inactivity. Automobiles, television, and other devices have profoundly changed the way people perform their everyday tasks. Many experts agree that most Americans face significant barriers to participation in physical activity, and until these barriers are eliminated will we see substantial behavior change in this area.

Public education efforts need to address the specific barriers confronting different age groups.[13] Older adults, for example, need information about safe walking routes, appropriate foot care and footwear, appropriate levels of exercise for those with coronary heart disease and other chronic conditions, and the availability of group activities in the community. This requires strong leadership from the public health community. A national physical fitness and sports campaign is needed which encourages a partnership between public and private sectors, and mobilizes national services.

Special efforts should be targeted at minority groups, less educated adults, older adults, and those with disabilities and chronic disease. Efforts should be undertaken to develop walking trails, other exercise facilities, and transportation policies which encourage walking and cycling. Professionals working in transportation, parks and recreation, schools, worksites, and organizations should collaborate in these tasks.

Schools are fundamental starting points for changing future physical activity patterns.[14] Physical education programs should provide children with enjoyable experiences that encourage continued activity into adulthood. Recent reports suggest that physical education in early childhood not only promotes health and well being, but also

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contributes to academic achievement. In 1987, both houses of congress passed a resolution encouraging state and local educational agencies to provide high quality daily physical education programs for all children in Kindergarten through 12th grade. Currently, only one state, Illinois, requires daily physical education as part of the curriculum. Most children in the lower grades are enrolled in physical education, but receive it fewer than 5 days per week. In the upper grades, fewer children are enrolled, but those that are may participate on a daily basis. Physical education needs to be more frequent for children in the lower grades. As well, daily adaptive physical education should be available for children with special needs. School physical education requirements are also recommended for students in preschool and post secondary programs. More time should be spent engaged in lifetime physical activities and more emphasis should be given to developing the knowledge, attitudes, cognitive skills, and physical skills needed to remain physically active throughout life.

The inactive lifestyle which prevails in the United States is viewed with alarm by public health professionals and exercise science professionals. Previously, efforts have concentrated on surveillance. Future efforts must build on it with a better understanding of why people do or don't exercise and why they do or don't "stay with it."[15]

The natural history of an individual's exercise behavior may be seen as having three major phases, with transitions between the phases. The first transition is from being sedentary to engaging in any exercise. Since less than ten percent of the U.S. adult population engages in sufficient exercise to lessen the risk of chronic diseases, the first transition may be the most important. Unfortunately, little is known about the first transition. The second is from engaging in any exercise to maintaining a regular exercise program. Exercise must be practiced consistently for the health and fitness benefits to be achieved. Of those who adopt regular exercise, about 50% drop out within one year. Dropouts may resume exercise, of course. Many people start and stop exercise programs several times. Interventions should focus on shortening the interval between dropout and the resumption of exercise.

In the past 20 years, almost 200 studies have been conducted on the determinants of exercise behavior. Some key points include:

Determinants of the adoption of exercise: Confidence in one's ability to exercise regularly, health, knowledge, attitudes towards exercise, and participation in moderate intensity activity at baseline seem to predict the adoption of exercise. Overall, however, little is known about why people begin to exercise. This is a topic of great importance, as many attempts are made to stimulate people to exercise without sufficient knowledge to assure success.

Determinants of maintaining regular exercise: Blue collar workers, overweight persons, those who have discomfort during exercise, smokers, and those with mood disturbances are especially likely to drop out of exercise programs. Strong determinants of continued participation include self motivation, behavioral skills, spousal support, perception of available time, access to facilities, and perception of good health.

Determinants of resuming exercise after dropout: Research in this area is sorely needed.

Determinants of exercise in children and adolescents: Family influences appear to be an important determinant of children's activity. Parents' obesity status and physical activity, parents' exercise beliefs, father's education, and direct parental encouragement have been associated with activity levels in children. Parental exercise is an important correlate of physical activity in teenagers.

We believe the principal role of exercise determinants research should be to provide data that may be used to guide the design of educational and policy-related exercise promotion interventions. Presently, our knowledge is rudimentary. Social, cognitive, physiological, and environmental factors all appear to be related to the maintenance of exercise. Specific determinants of exercise adoption, maintenance, and resumption after dropout may be different, and therefore require special foci.

Most patients seen by primary care providers can benefit from encouragement and advice on physical activity, and 85% of adults say that a doctor's recommendation would help them get more involved in regular exercise. Unfortunately, physical activity assessment and counseling are not routine in medical practice.[16]

A comprehensive, public health approach to the promotion of physical activity may also be fruitful.[17] One example of this approach is the Pawtucket Heart Health Program, a community wide, multiple risk factor intervention study. It is based on principles derived from a range of disciplines and theories, including social learning theory, community organization and community psychology approaches, and diffusion theory. Although the long-term cost effectiveness of this approach remains to be determined, the short term benefits gained from increases in physical activity, including increases in daily functioning, well being, weight control, and overall functional capacity, provide a solid rationale for further community-based efforts in this area.

Ultimately, however, the challenge is not to get people to exercise in any form, but to get them to maintain adequate physical activity throughout the lifespan.

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Nutrition for the 1990s: Planning to Prevent Chronic Disease

Nancy Beauchene, MS, RD, John P. Fulton, PhD

Changing the dietary habits of a diverse population is a very complex task. Only by uniting as a community will we achieve success.

Unhealthy diet, a major cause of chronic disease, is associated with five of the ten leading causes of death in the United States, including coronary heart disease, certain cancers, stroke, non-insulin dependent diabetes, and atherosclerosis. McGinnis and Foege have identified unhealthy diet, combined with physical inactivity, as the second leading *actual cause of death*, following tobacco use.[1]

Although Americans have reduced total fat consumption from 42% in the late 1960's to approximately 36% today, the weight of Americans has steadily increased since 1980,[2,3] probably because fewer Americans are consuming nutritionally sound meals prepared in the home. Overweight and obesity are associated with coronary heart disease and its risk factors, including hypertension, hypercholesterolemia, and non-insulin dependent diabetes.[4] The diet industry's revenues are at an all time high, estimated to be $40 billion to $50 billion per year, with 65 million Americans attempting to lose weight at any given time.[5] According to the 1990 Health Interview Survey conducted by the Rhode Island Department of Health (the Department), approximately 20% of Rhode Islanders are overweight. The highest prevalence is among African Americans at 28% and Hispanic Americans at 26%.[6] However, national studies reveal a much higher prevalence of obesity among African American women, approximately 49%.[3] Research has shown that the impact of diet-related chronic diseases, including coronary heart disease, stroke, and diabetes, is greatest among minority groups and people of low income.[2,7,8]

Obesity is largely attributable to the eating habits and physical activity levels of a population. Americans' diets are well above recommended levels for fat and saturated fat, as well as sodium and cholesterol, and below the recommended levels of complex carbohydrates and fiber. In 1989, only 29% of Rhode Island adults reported eating the recommended five servings of fruits and vegetables per day.[9] In 1991, 55% were characterized as sedentary.[10]

Planning for a Healthier Diet

Year 2000 Nutrition Objectives: In response to the unhealthy diet of Americans, the US Department of Health and Human Services (USDHHS), as part of their program to select national health promotion and disease prevention objectives for the year 2000,[11] proposed 21 nutrition objectives. The objectives relevant to the reduction of chronic disease address the consumption of dietary fat, saturated fat, complex carbohydrates, fiber, and sodium, as well as obesity, per se. Ancillary objectives address food labeling, the availability of low fat foods in a variety of settings, nutrition education in schools and worksites, and the provision of nutrition counseling by primary care providers, nutritionists, and dietitians. Rhode Island has adopted three of the national nutrition objectives as part of its own priority health promotion and disease prevention objectives for the year 2000 (Table 1).

Table 1. Year 2000 nutrition objectives for Rhode Island.

- Increase healthy diet by reducing dietary fat intake to 30% of calories or less and saturated fat intake to less than 10% of calories among 60% of people aged 2 and older.
- Increase healthy diet by increasing complex carbohydrate and fiber-containing foods in the diets of 60% of adults to 5 or more servings of vegetables (including legumes) and fruits, and to 6 or more daily servings for grain products.
- Reduce the mean serum cholesterol concentration among adults to no more than 200 mg/dL.

Source: State of Rhode Island and Providence Plantations. *Healthy People 2000 Rhode Island. Publication No. 6.* Providence, RI: Rhode Island Department of Health; 1994.

A National Action Plan: To meet year 2000 nutrition objectives nationally, professionals from the public and private sectors were called together to develop a joint action plan for healthy eating. In 1993, *The National Action Plan to Improve the American Diet: A Public/Private Partnership* was completed.[12] Because nutrition-related problems are complex, the first priority of the national action plan is to encourage all the states to form partnerships with private, public, non-profit, and food industry sectors, and the public at large. The second priority is to increase demand for a healthier mix of foods in the diet. The third is to enhance educational efforts to a wide range of people.

The Nutrition Advisory Forum of Rhode Island: Locally, the department has convened representatives from Rhode Island's nutrition professionals to develop a strategic plan to improve the diet of Rhode Islanders and thereby prevent chronic disease. The Nutrition Advisory Forum of Rhode Island (the Forum) embodies the broad partnership of community members envisioned by the National Plan (Table 2). Forty-four organizations are represented on the Forum. To facilitate strategic planning, the Forum has created a Planning Committee (the Planning Committee) of workable size (about 15 members). This group will complete a draft strategic plan in a series of six 2-hour meetings, with intervening subcommittee work.*

Working Goals for Healthy Diet in Rhode Island: As a first step in strategic

*(To participate in the Nutrition Advisory Forum of Rhode Island, please call Ms. Nancy Beauchene, MS, RD, Division of Preventive Health Services, R.I. Department of Health, at 401-277-3442.)

ABBREVIATIONS USED
DEM: Department of Environmental Management
USDHHS: US Department of Health & Human Services
WIC: Women, Infants & Children Program

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Table 2. Current membership in the Nutrition Advisory Forum of Rhode Island.

American Cancer Society, RI Division
American Heart Association
ARA Services
Blue Cross Blue Shield of RI
East Providence High School
Edwards Superstores
Eleanor Slater Hospital
Food Dealers Association
Harvard Community Health Plan
Johnson & Wales University
Kent County Visiting Nurses Association
Manhattan Tomato Company
Memorial Hospital of RI
Miriam Hospital
New England Clinic
New England Dairy Council
Nutrition Council of RI
Pro Health
Providence Journal Bulletin
RI Child Care Directors Association
RI Community Food Bank
RI Department of Education
RI Department of Health
RI Dietetic Association
RI Division of Agriculture - DEM
RI Head Start Program
RI Hospital
RI Hospitality Association
RI Medical Society
Shaw's Supermarket, Inc.
South County Health Center
St. Joseph Hospital
Stop & Shop Supermarket, Co.
Thundermist Health Care Center
Tourtellot & Co., Inc.
University of RI, Cooperative Extension
University of RI
US Public Health Service
Veteran's Administration Medical Center
Washington State Apple Commission
WFIT
WJAR
Women's Health Initiative
Women & Infants Hospital

planning, the Forum was polled by mail to enumerate basic nutrition goals for the State. The results are listed in Table 3, edited slightly for uniformity of format. The most common responses included:

- Decrease low-income barriers to healthy diet.
- Increase knowledge of healthy diet.
- Reduce obesity.
- Reduce fat in the diet.
- Increase fruits and vegetables in the diet.

The working goals listed in Table 3 were taken by the Planning Committee as the basis of the strategic planning process.

A Vision for Healthy Diet in Rhode Island: One of the Planning Committee's first tasks was to develop a vision for healthy diet in Rhode Island to guide the planning process, and later to guide interventions guided by the strategic plan. Typically, such a vision is modified as the planning process matures. Currently, the vision reads:

> "A Rhode Island in which all individuals, throughout their lifespan, have the personal resources, knowledge, motivation, access, and environmental exposures to practice those healthful eating and feeding behaviors which prevent disease, promote health, and improve quality of life."

Health Outcome Objectives: Based on the working goals for healthy diet, the Planning Committee defined three broad health outcome objectives. Currently, the wording of these objectives is fluid, as the Planning Committee pursues alternative structures for its strategic plan. However, the spirit of these objectives is embodied in the following language:

- Prevent failure to thrive among infants and elders.
- Prevent chronic illness throughout the lifespan.
- Promote physical functioning throughout the lifespan.

Risk Reduction Objectives: Similarly, the Planning Committee has drafted a number of risk reduction objectives which, if achieved, would lead to the achievement of health outcome objectives. This list, contained in Table 4, is also fluid, thus subject to change in the course of planning. Broadly speaking, the risk reduction objectives seek to modify the mix of nutrients in the diet, to promote breastfeeding, to reduce obesity, and to increase physical activity. The latter is seen by the Planning Committee as an essential companion to diet modification in the achievement of all health outcome objectives.

Priority Populations: Five priority populations have been suggested to the Planning Committee as special foci of planning. These groups are considered by some to be at high risk nutritionally and to require special interventions to achieve nutritional objectives:

- African Americans
- Hispanic Americans
- Native Americans
- Persons of low income
- Youth

The Planning Committee will consider these and other suggestions to identify priority populations in the strategic plan.

Other Elements of a Strategic Plan: The Planning Committee will also define "service and protection objectives" to help achieve risk reduction objectives. For example, the service and protection objective, "increase the use of healthy foods in school meals," might be defined to help achieve the risk reduction objective, "reduce fat in the diet." In the same vein, the Planning Committee will select strategies and activities to achieve service and protection objectives. For example, the activity, "convene a school nutrition standing committee from the Rhode Island community," might be defined to help achieve the service and protection objective, "increase the use of healthy foods in school meals."

Special Planning for Nutrition in the Schools: As described above, "youth" has been suggested as a priority population, a group considered to be at high risk nutritionally and to require special interventions to achieve nutritional objectives. For example, only 13% of American high school students consume the recommended five servings of fruits and vegetables per day,

Table 3. Nutrition goals critical for the prevention of chronic disease in Rhode Island: results of polling the Nutrition Advisory Forum of Rhode Island.

- Decrease low-income barriers to healthy diet.
- Increase breastfeeding.
- Improve the overall nutrition of elders.
- Increase knowledge of healthy diet.
- Improve parents' knowledge of healthy diet for children.
- Improve school nutrition curricula.
- Reduce obesity, especially in childhood.
- Reduce physical inactivity.
- Reduce fat in the diet.
- Increase fruits and vegetables in the diet.
- Increase the use of healthy foods in home-cooked meals.
- Increase the use of healthy foods in restaurant meals.
- Provide breakfast in schools.
- Increase the use of healthy foods in school meals.
- Improve food labelling.
- Increase food safety.
- Decrease the use of fad diets.
- Reduce the prevalence of eating disorders among students.
- Obtain 3rd party reimbursement for nutrition counselling.
- Improve funding for the Women, Infants, and Children (WIC) Nutrition Program.

Note: These goals have been edited slightly to achieve uniformity of format.

Table 4. Draft risk reduction objectives.

- Reduce fat in the diet.
- Increase fruits and vegetables in the diet.
- Increase complex carbohydrates in the diet.
- Increase fiber in the diet.
- Increase calcium in the diet of selected sub-populations.
- Decrease sodium in the diet of selected subpopulations.
- Increase iron in the diet of selected subpopulations.
- Increase folic acid in the diet of selected subpopulations.
- Increase breastfeeding.
- Reduce obesity.
- Increase physical activity.

and only 35% attend daily physical education classes; these behaviors have contributed to an increase in childhood obesity, setting the stage for premature cardiovascular disease in adulthood.[4] As the Forum was being organized, the Rhode Island Departments of Health and Education were awarded a grant from the Centers for Disease Control and Prevention to develop and implement their "Comprehensive School Health Program" to improve the health status of Rhode Island's school-age children. Accordingly, the Forum created the School Nutrition Standing Committee to plan for the improvement of nutrition services in Rhode Island's schools. The Standing Committee's recommendations are in the primary stages of development. Priority areas defined thus far include:

- The composition of school meals
- The nutrition education of school children
- Provision of nutrition services in the schools
- Parent and community involvement in school nutrition

Putting Plans into Practice

Once a strategic plan to improve the diet of Rhode Islanders is complete, the department will convene the forum to discuss putting the plan into action, with special focus on priority populations. Priorities for action will be selected and implemented. Two broad classes of activities will undoubtedly be represented among the priorities for action:

- The development of community partnerships for interventions
- The development of financial and in-kind support for interventions

The department will perform three functions in this process. It will perform basic surveillance on the nutrition of Rhode Islanders, it will convene the Forum regularly to monitor progress toward the achievement of nutrition and health objectives and to modify the strategic plan, as necessary, and it will work with its partners in the community to assure the development and continuation of effective nutrition interventions throughout the State and especially for priority populations. Changing the dietary habits of a diverse population is a very complex task. Only by uniting as a community will we achieve success.

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Cardiovascular Health in RI: An Approach for the '90s

Judith P. Feldman, MD, MPH, Francis A. Donahue, MPA,
John P. Fulton, PhD, David Chatel, BA

Presently, we need to determine the most effective mix of programs, and how to adapt and diffuse the experience and knowledge gained to different communities.

Cardiovascular disease (CVD; in particular, coronary heart disease and stroke) is the main cause of death in both the United States and Rhode Island. Research has established that actions taken to reduce the incidence of heart disease and stroke can also be effective in preventing many parallel chronic diseases, including diabetes, osteoporosis, and certain types of cancer.

Today, a firm scientific basis exists for the promotion of healthy living. Health authorities now know that the major risk factors for CVD are either preventable or controllable. Over the last 30 years, studies have shown consistently that smoking, high blood pressure, elevated serum cholesterol, and physical inactivity all increase the risk of CVD. In any prevention effort, lifestyle and environmental factors are clearly of paramount importance.[1]

Admittedly, some of the factors associated with CVD are currently unalterable, such as genetics, advancing age, and male gender. Encouraging biomedical advances have made it possible to identify and manage the heart heath of individuals with genetic traits that put them at greater risk. However, when unmodifiable risk factors are present, they magnify the effect of the preventable or controllable risk factors.[1]

Fully translating research knowledge into action requires collaboration and communication between researchers and those who design and implement public policy and programs. The collaborative approach described in this paper is a call for health and social professionals, scientists, policy makers, media organizations, program planners, and representatives of the private and nonprofit sectors in Rhode Island to recognize the importance of working together to improve cardiovascular health statewide.

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The Need for Cardiovascular Disease Prevention Services

The term cardiovascular disease (CVD) pertains to conditions affecting the heart and blood vessels, including coronary heart disease (CHD), atherosclerosis, stroke, and high blood pressure.

Table 1. Cardiovascular health objectives and baseline measurements from *Healthy People 2000.*

Reduce coronary heart disease deaths to no more than 100 per 100,000 people.[a]
—> Baseline: 135 per 100,000 in 1987
Reduce stroke deaths to no more than 20 per 100,000 people.[a]
—> Baseline: 30.3 per 100,000 in 1987
Reverse the increase in end stage renal disease (requiring maintenance dialysis or transplantation) to attain an incidence of no more than 13 per 100,000.[a]
—> Baseline: 13.9 per 100,000 in 1987

a - Age-adjusted using the 1940 population of the US as the standard population.

CVD is the leading cause of death, disability and health care expenditure in the US. Almost one in two Americans dies of CVD, more than one in four has some form of the disease, and CVD-related health care costs are estimated to top $100 billion annually. The impact of CVD on health care costs and on productivity of the adult population in the US is striking. Persons with CVD incur over one-third of the nation's total estimated health care costs for adults each year. They also account for an estimated one-third of bed disability days.[1]

The impact of CVD is similar in Rhode Island. 43% of Rhode Island deaths in 1991 resulted from CVD. In comparison, cancer, the second leading cause of death, accounted for 25% of Rhode Island mortality.[2]

Certain segments of the US population are at higher risk of CVD. For example, during 1989-1991, 86% of all CVD mortality occurred among persons 65 years of age or older, while only 2% occurred among persons under 45 years of age. Stroke mortality was 10 times higher for persons 65 years of age or older than for persons 45-64 years of age. Age-adjusted CVD mortality was 90% higher for males than females, due primarily to the large age-adjusted mortality differential for diseases of the heart. African Americans and persons of lower socio-economic status are affected disproportionately by CVD. African Americans have the highest CVD mortality of any group other than elders. CVD mortality is 48% higher among African Americans than Americans of European origin.[1]

Since the late 1960s, CVD mortality has declined 22% in Rhode Island and 15% in the US as a whole. Although improved medical care is responsible for some of the decline, it appears that lifestyle changes, which began in the early 1960s, account for most of the decline.[1,2]

Goals for a Cardiovascular Disease Initiative

In 1990, the US Public Health Service released *Healthy People 2000: National Health Promotion and Disease Prevention Objectives*, a national strategy for significantly improving the health of the Nation over the coming decade.[1] Objectives were established for 22 priority areas including heart disease and stroke (Table 1).

In Rhode Island, a Governor's Year 2000 Health Objectives Task Force was established to plan a Rhode Island response to the national effort.[2] The Task Force chose to target risk factors, rather than adopt a "disease category" approach. Twenty three

ABBREVIATIONS USED
AHA: American Heart Association
ASSIST: American Stop Smoking Intervention Study
CHD: Coronary heart disease
CVD: Cardiovascular disease
PHHP: Pawtucket Heart Health Program

Table 2. Objectives for cardiovascular health adopted by the RI Governor's Year 2000 Health Objectives Task Force.

Objective 1. Increase physical activity by:
- Increasing to 60% the proportion of people aged 6 and older who engage regularly, preferably daily, in light to moderate physical activity for at least 30 minutes per day, and
- Reducing to 15% the proportion of people aged 6 and older who engage in no leisure time physical activity.

Objective 2. Increase healthy diet by:
- Reducing dietary fat intake to 30% of calories or less and saturated fat intake to less than 10% of calories among 60% of People aged 2 and older,
- Increasing complex carbohydrate and fiber-containing foods in the diets of 60% of adults to 5 or more servings of vegetables and fruits, and to 6 or more daily servings of grain products, and
- Reducing the mean serum cholesterol concentration among adults to no more than 200 mg/dl.

Objective 3. Reduce tobacco exposure by:
- Reducing cigarette smoking to a prevalence of no more than 15% among people aged 20 and older,
- Reducing the initiation of smoking by children and youth so that no more than 15 % have become regular cigarette smokers by age 20, and
- Reducing smokeless tobacco use by males aged 12 to 24 to a prevalence of no more than 0.5%.

Objective 13. Reduce exposure to environmental tobacco smoke by:
- Enacting and enforcing comprehensive laws on clean indoor air that prohibit or strictly limit smoking in the workplace and enclosed public places,
- Reducing by 50% the number of children exposed to environmental tobacco smoke in enclosed places, and
- Increasing to 50% the number of workplaces that are smoke free.

Objective 19: Reduce high blood pressure, by:
- Increasing to at least 75% the proportion of people with high blood pressure whose blood pressure is under control.

health objectives were selected to assist the state in achieving the national year 2000 objectives. Five of these objectives relate to the reduction of CVD risk factors (Table 2).

Community Investment

Rhode Island is a small, compact, mostly urban area with a population of just over 1 million and a strong history of collaboration in preventive health services. The state is fortunate in that it has a number of dynamic and enterprising health agencies that uniquely prepare it to develop a model statewide CVD program.

The Rhode Island Department of Health is actively engaged in its Year 2000 mission of fulfilling society's interest in assuring conditions in which the people of Rhode Island can be healthy. This mission can only be accomplished by the efforts of the private and public sectors acting together. The roles of the department in CVD prevention are:

Assessment: Assessment of cardiovascular health needs in Rhode Island, based on statewide data collection.

Policy Development: Establishment of statewide cardiovascular health objectives; Assurance of appropriate organized statewide efforts to develop and maintain essential personal, educational health services; provision of access to necessary services, and solution of problems inimical to health.

Assurance: Assurance of an adequate statutory base for cardiovascular activities in the state.[3]

The Pawtucket Heart Health Program (PHHP) is a nationally known research project to learn how to improve the cardiovascular risk profile of an entire population. Over 500 organizations were involved in the course of a decade, including churches, social clubs, supermarkets, restaurants, schools, and several municipal agencies. PHHP focused on risk factors for CVD such as smoking, unbalanced diet, blood cholesterol, high blood pressure, and physical activity. PHHP is an abundant resource of knowledge and experience upon which to base effective community interventions for CVD reduction.

The Rhode Island Affiliate of the American Heart Association (AHA) has long been very active in heart health education, and has been very much a partner in the public health effort to prevent CVD. It has worked with the state legislature to restrict tobacco use, collaborated in Rhode Island Project ASSIST (smoking prevention and cessation), organized community-based minority initiatives, and is currenetly a partner with the department in a worksite hypertension screening program. The Executive Director of the Rhode Island Affiliate is the Chairperson of the Rhode Island Cardiovascular Disease Prevention Council. The agency is an active, involved partner in all the state's efforts to reduce CVD.

Rhode Island has a cadre of well trained **primary care providers** who come into regular contact with a large proportion of the population. Primary care providers are important partners in the development of cardiovascular disease prevention. Public health initiatives in this field need to be coordinated with those of professional associations and with the daily activities of clinical practitioners. The Rhode Island Medical Society and the local chapters of the American College of Physicians, the Society of Internal Medicine, and the Academy of Family Practice offer educational programs that include CVD topics. There are abundant opportunities for practitioners to increase their involvement in such areas as smoking cessation, nutrition, promotion of physical fitness, high blood pressure monitoring, and systematic risk assessment and follow-up of their patients.

The Brown University School of Medicine is the center of medical education and training in Rhode Island. Education of clinical practitioners in CVD prevention, especially in the appropriate preventive guidelines for primary care practice, and skills and knowledge in the area of prevention are of critical importance to the medical student and later to patients and the community at large. The Medical School serves as a center for research and education on health behaviors. The Behavioral Medicine Center at Miriam Hospital has pursued research on risk behavior and on professional education for primary care physicians in prevention.

The neighborhood health centers network serves nearly 40,000 low income, minority, and disadvantaged persons, many of whom are at risk for CVD. RIte Care will also improve access to preventive services for the Medicaid population, many of whom are minority individuals and persons of low income. These populations have consistently demonstrated a higher prevalence of CVD than more affluent groups. Preventive services need to be targeted aggressively at lower socio-economic groups in an effort to reduce disparities in CVD risk. Health education around the risk factors of CVD is a high priority in the community health centers and among other providers who serve RIte Care clients.

Organizations in the private and voluntary sectors with interests in heart health include, among others, managed care sys-

Table 3. Draft Strategic Cardiovascular Health Plan for Rhode Island.

Vision

A Rhode Island in which all individuals, with societal support, adopt a lifestyle which minimizes cardiovascular disease.

Health Outcome Objectives

1. Reduce stroke deaths to no more than 18 per 100,000 people.[a]
—> RI baseline: 25/100,000 in 1986 and 21/100,000 in 1991.
1a. Reduce stroke deaths among African Americans to no more than 35 per 100,000 people.[a]
—> RI baseline: 44/100,000 in the period 1986-1991.
2. Reduce coronary heart disease deaths to no more than 40 per 100,000 women and 81 per 100,000 men.[a]
—> RI baseline: 98/100,000 women, 203/100,000 men in 1986; 63/100,000 women, 128/100,000 men in 1991.

Risk Reduction Objectives

1. Reduce the initiation of cigarette smoking by children and youth so that no more than 15 percent have become regular cigarette smokers by age 20.
—> RI baseline: 25% of children and youth under age 20.
2. Reduce cigarette smoking to a prevalence of no more than 15% among people aged 20 and older.
—> RI baseline: 26% of people aged 20 and older.
3. Reduce dietary fat intake to an average of 30 percent of calories or less, and average saturated fat intake to an average of 10 percent of calories or less among people aged 2 and older.
—> US baseline: 36% of calories in 1988.
4. Increase to at least 30 percent the proportion of people ages six and over who engage regularly, preferably daily, in light to moderate physical activity for at least 30 minutes per day.
—> US baseline: 22% of people aged 18 and older were active for at least 30 minutes, 5 times per week, and 12% were active for at least 30 minutes, 7 or more times per week in 1985.
5. Increase to at least 50 percent the proportion of people with high blood pressure whose blood pressure is under control. (National Baseline: 21% of hypertensives with blood pressure < 140/90 mm Hg on one occasion measurement and reported currently taking antihypertensive medications in 1988-1991.)
6. Increase to at least 60 percent the proportion of adults with high blood cholesterol who are aware of their condition and are taking action to reduce their blood cholesterol to recommended levels. (National baseline: 30% of people with high blood pressure were aware that their blood cholesterol level was high in 1988.)

a -Age-adjusted using the 1940 population of the US as the standard population.

tems, hospitals, clinical and academic medicine, consumers, health insurance, the food industry, business, and labor.

Consumers who are well informed about the prevention and treatment of CVD provide a sound base for long-term marketing policies.

The value of community-based heart health programs in reducing CVD and its risk factors has been demonstrated. Presently we need to determine the most effective mix of programs, and how to adapt and diffuse the experience and knowledge gained to different communities.

The ultimate success of health promotion programs depends on community support and commitment. There is an increasing appreciation of the value of involving communities in various stages of health programs, including needs assessment, planning, implementation, and evaluation.

Progress Thus Far

The Rhode Island Department of Health organized the Rhode Island Cardiovascular Disease Prevention Advisory Council in early 1994. The mission of the council is to provide the health department with recommendations for the development, implementation, and evaluation of a statewide program to reduce the risk and burden of CVD. These initiatives will emphasize approaches to risk reduction within communities, worksites, schools, health care organizations, and governmental units. The council has drafted a Strategic Cardiovascular Health Plan to guide the state's efforts to achieve its Year 2000 Health Objectives, and as a result, to reduce more dramatically CVD morbidity, disability, and mortality (Table 3).

The Division of Preventive Health Services in the department has established four program initiatives to accomplish the goals of cardiovascular disease prevention: tobacco control, hypertension control, public health nutrition, and physical fitness and health.

Tobacco Control: Tobacco control is very high on the department's agenda. To achieve its goals in this area, the department has aggressively pursued funding for tobacco control interventions. Rhode Island is the recipient of a multi-year National Cancer Institute grant (Project ASSIST), to reduce cigarette smoking in all segments of our population. This is accomplished through a population based approach emphasizing media advocacy and policy development. The department seeks to provide smoking prevention and cessation messages, to enforce restrictions on tobacco sales to minors, to support legislation restricting or forbiding smoking in public places, such as schools, and to sponsor media events which bring health-related tobacco issues to the forefront. The tobacco control program has had a direct and significant impact on legislation reducing the use of tobacco and exposure to tobacco smoke.

Hypertension Control: The Office of Secondary Prevention provides worksite blood pressure screening through an arrangement with the Rhode Island Affiliate of the American Heart Association. "Screening Plus", provides high blood pressure screening, education, and a trained volunteer from the site to follow-up with repeat screening, information, and education. During the past year this initiative has been involved with over 100 Rhode Island businesses and industries and has impacted on thousands of workers.

Public Health Nutrition: The Office of Primary Prevention has established a position responsible for the development and implementation of nutrition activities specific to the prevention of chronic disease, including CVD and cancer. One of the major efforts is the 5-A-Day for Better Health project which encourages individuals to eat at least five servings of fruits and vegetables per day, as part of a low-fat diet. This initiative provides a simple, positive, and consistent message on diet that is beneficial in the prevention and control of several chronic diseases, including CVD.

Physical Fitness and Health: The Physical Activity Program of the Office of Primary Prevention provides staff assistance to the Governor's Council on Physical Fitness and Health. This council, broadly representative of all Rhode Islanders, provides recommendations to the Governor on the

status of physical fitness among the states' residents. The Physical Activity Program, in collaboration with the council, has adopted Year 2000 Health Objectives pertaining to physical activity as its own agenda and is actively working to incorporate those objectives in the infrastructure of the state using executive and legislative means.

Direction for the Future

Cardiovascular disease is largely preventable. We have the scientific knowledge to create a state in which heart disease and stroke are rare.

Healthy living includes good nutrition, a tobacco-free lifestyle, regular physical exercise, and a supportive environment. To implement a statewide policy of CVD prevention, individuals and their communities must unite with health professionals, scientists, industry, and policy makers.

It is evident from the downward trends in CVD that we know how to reduce its toll even though it still remains a major problem. To reduce CVD mortality significantly, high risk populations must be targeted for intervention. The primary challenges now are to maintain the downward trend, and to reach out to socially disadvantaged populations where CVD is not waning. The success of these efforts will depend on accurate, appropriate, and culturally sensitive materials, messages and interventions.

The prescription is simple. To implement it is more difficult. The promotion of heart health on a statewide scale requires clear agreement on policy principles, implementation processes, and partnerships to make it happen.

Implementing community-level heart health programs requires more than scientific and practical know-how. It requires political and financial support from all sectors of society with a stake in the success of heart-health policies. Marshalling this support requires a commitment from those who influence government and corporate agendas. Health and social science professionals and community leaders who understand the potential value of CVD prevention policies must convince government and the private and voluntary sectors of the need to act.

The Rhode Island Cardiovascular Disease Prevention Advisory Council will provide a forum for the blending of the many constituencies necessary for an effective partnership. The Rhode Island CVD program offers an opportunity for the community to work together to continue to reduce the morbidity, disability, and mortality associated with the state's number one health problem. The department is prepared to provide public health assessment, leadership, and assurance in this most important endeavor.

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3. Epstein WL. Erythema nodosum. In: Samter M, ed. *Immunological Diseases,* 2nd ed. Boston, Mass.: Little, Brown; 1971;2:944-951.

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HEALTH BY NUMBERS

Rhode Island Department of Health
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Director of Health

Edited by Jay S. Buechner, PhD
Chief, Office of Health Statistics

Screening for High Blood Cholesterol Among RI Adults

To help develop a cardiovascular health plan, the Rhode Island Department of Health analyzed data from its Behavioral Risk Factor Surveillance System to assess the prevalence of screening for high blood cholesterol among Rhode Island adults from 1988 to 1993.

The Rhode Island Behavioral Risk Factor Surveillance System (BRFSS) annually conducts telephone interviews with about 1,800 randomly selected Rhode Island adults, who are asked about sociodemographics and health-related behaviors, including screening for high blood cholesterol. Questions on the latter were asked in 1988, 1989, and 1991–1993.

The percentage of Rhode Island adults who reported that they were screened at least once for high blood cholesterol in the 5 years preceding each BRFSS survey increased dramatically from 51% in 1988 to 70% in 1991, then levelled off in 1992 (72%) and 1993 (71%; Figure 1). The percentage of adults screened increases with age (Figure 2). Less than half (41%) of adults ages 18–24 had been screened at least once in the 5 years preceding the BRFSS surveys of 1991–1993; in contrast, about 85% of adults ages 45 and above had been screened. The percentage of adults screened also varies by ethnicity and race (Figure 3). About 6 of 10 Hispanics and non-Hispanic blacks had been screened at least once in the 5 years preceding the BRFSS surveys of 1991–1993; about 7 of 10 non-Hispanic whites had been screened in the same period.

In 1984 the National Institutes of Health held a consensus conference entitled "Lowering Blood Cholesterol to Prevent Heart Disease." Following the conference, a consensus panel concluded: "It has been established beyond a reasonable doubt that lowering definitely elevated blood cholesterol levels (specifically, blood levels of low-density lipoprotein [LDL] cholesterol) will reduce the risk of heart attacks caused by coronary heart disease. . . . All physicians should be encouraged to include, whenever possible, a blood cholesterol measurement on every adult patient when that patient is first seen. . . . While we are not at this time recommending mass screening, a feasibility study of various screening methods in adults should be considered."[1] In 1990, the National Cholesterol Education Program released the *Report of the Expert Panel on Population Strategies for Blood Cholesterol Reduction*, confirming recommendations that all adults should be screened for high blood cholesterol "at least once every 5 years," adding "... that public screening for blood cholesterol be undertaken only under conditions that ensure adherence to high quality standards."[2]

Accordingly, the Cardiovascular Health Advisory Council of the Rhode Island Department of Health has suggested that the Rhode Island community adopt the following risk reduction objective (objective 15.8 from *Healthy People 2000; National Health Promotion and Disease Prevention Objectives for the Nation*[3]):

"Increase to at least 60% the proportion of adults with high blood cholesterol who are aware of their condition and are taking action to reduce their blood cholesterol to recommended levels."

The first step in achieving this objective is to assure that all Rhode Island adults have been screened for high blood cholesterol at least once in the past 5 years. The Rhode Island data suggest that we are well on the

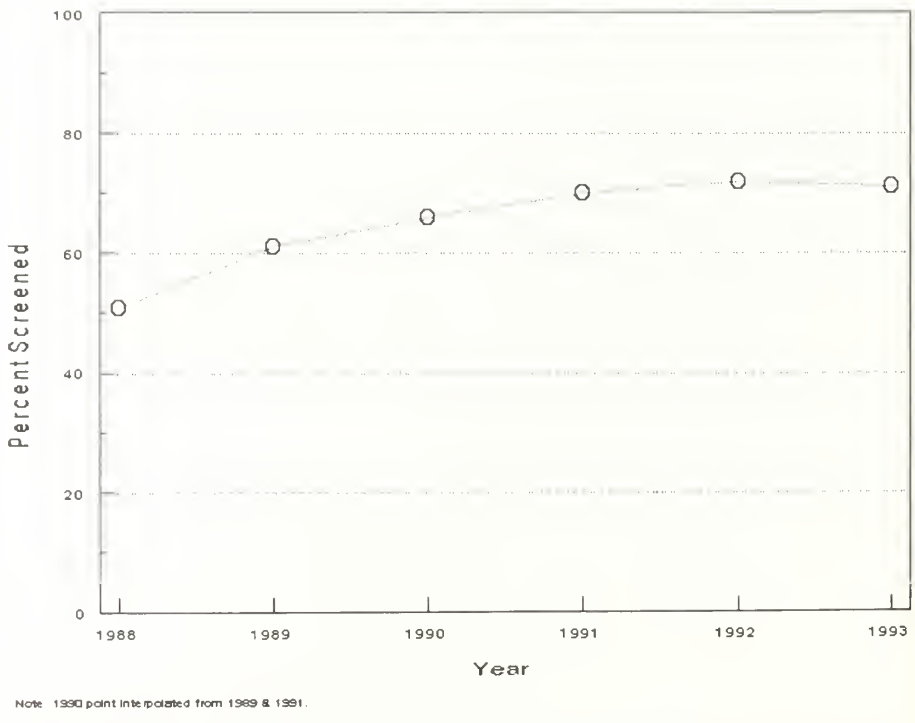


Fig 1.—Percentage of adults (ages 18 and over) screened for high blood cholesterol at least once in the past five years, Rhode Island, 1988-1993

Submitted by John P. Fulton, PhD, Division of Preventive Health Services. Health by Numbers *is edited by Jay S. Buechner, PhD, and William J. Waters, Jr., PhD*

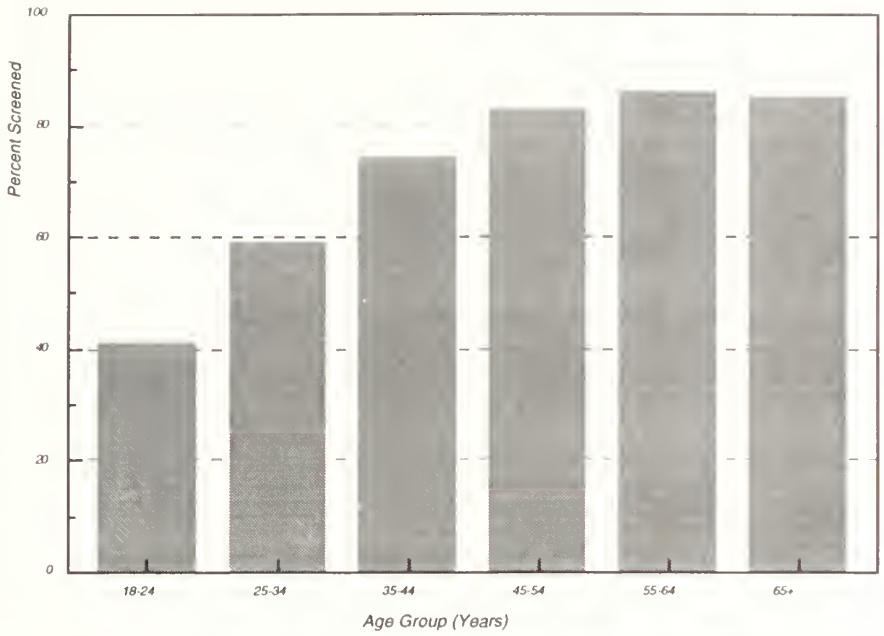
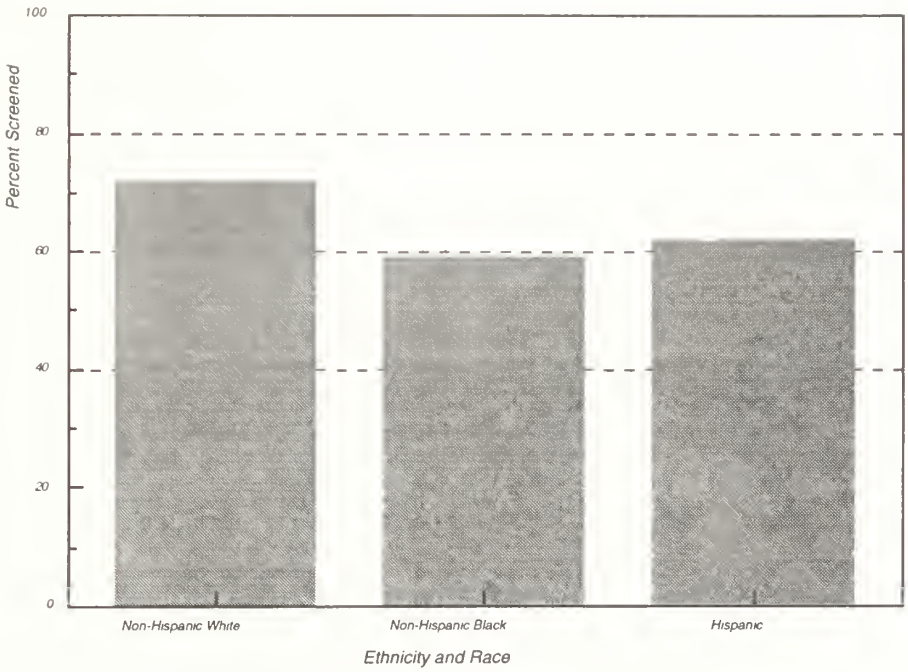


Fig 2.—Mean percentage of adults (ages 18 and over) screened for high blood cholesterol at least once in the past five years, Rhode Island, 1991-1993, by age.

Fig 3.—Mean percentage of adults (ages 18 and over) screened for high blood cholesterol at least once in the past five years, Rhode Island, 1991-1993, by ethnicity and race.



way to this sub-objective, but that emphasis must be placed on screening younger adults and certain ethnic and racial subgroups more extensively. This issue will be explored in a future public health briefing prepared for the consideration of the Cardiovascular Health Advisory Council.

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Public Health Briefings

Rhode Island Department of Health
Barbara A. DeBuono, MD, MPH, Director

Edited by Judith Feldman, MD,
John P. Fulton, PhD, and Bela Matyas, MD

The Tobacco Vending Machine: An Idea Whose Time Has Passed

John P. Fulton, PhD

In July 1994 Gov. Bruce Sundlun created the Task Force to Restrict Youth Access to Tobacco. The task force was charged with recommending policies and procedures designed to reduce youth access to tobacco products through education, enforcement and community support initiatives. In September, the task force undertook a statewide Tobacco Vendors Compliance Survey to measure tobacco vendors' compliance with the Rhode Island state law that prohibits the sale of tobacco to persons under 18 years of age. Cigarettes were offered for sale to minors at 100 of 175 (57%) over-the-counter sites. Minors were not challenged in the use of tobacco vending machines at 70 of 85 (82%) vending machine sites. These results are similar to those reported elsewhere, demonstrating the relative ease with which minors can obtain cigarettes from tobacco vending machines.

Vending machines are labor saving devices. They permit sales in places where volume is insufficient to support a sales clerk but where purchasers value the availability of certain items for sale. They also reduce the cost of sales where volume is sufficient to support a sales clerk, but customer assistance is unnecessary. For example, it is convenient for hotel guests to have access to soft drinks, snacks, and sundries near their rooms. Vending machines permit hotels to provide this access at low cost.

The trouble with kids is they don't always listen to directions, including state laws. Kids need adult supervision to set effective limits on behavior. If kids listened to directions without adult supervision, they wouldn't purchase tobacco products in Rhode Island, where the practice is prohibited for all persons under 18. But they do, and from 20% to 30% of Rhode Island's high school seniors are regular smokers (the proportion varies by demographic subgroup). Kids purchase *millions* of packs of cigarettes every year in Rhode Island.

John P. Fulton is assistant director, Division of Preventive Health Services, Rhode Island Department of Health, and Clinical Assistant Professor of Community Health, Brown University School of Medicine.

Poor Limit Setters

Currently, when minors attempt to purchase cigarettes, they have the following choices: ask a sales clerk to sell them a pack, or drop some quarters into a nice, secluded vending machine. Half the time (and that proportion is growing with tobacco vendor education in the state), the clerk will challenge them. Even "safe" clerks, who don't challenge cigarette purchases, tend to come and go, given the nature of the job. In short, asking a sales clerk to sell a pack of cigarettes is an "iffy" affair. The vending machine, by contrast, if itself unsupervised by an adult, merely confronts purchasers with a small sign, advising them that the purchase of tobacco products by persons under 18 years of age is illegal. These signs, as one may imagine, are not effective in limiting the behavior of teens in search of cigarettes, especially those addicted to nicotine who crave another smoke. As limit-setters, vending machines are complete failures.

Tobacco vending machines, as currently designed, need human supervision to set limits with underage purchasers. Someday, of course, "smart" vending machines might be able to differentiate between minors and adults. Right now, however, tobacco vending machines are dumb. They need our help. They need, at a very minimum, to be watched by responsible persons. This means they have to come out of the closet, literally, and the foyer, and the basement, and all the other places they have provided a convenience to smokers. Then, if we want to protect the machines from the foibles of human supervisors (they do turn their backs, once in a while, and they can get awfully busy with more important tasks), we need to install electronic switches in the machines, switches controlled by supervisors that activate the machine only momentarily.

Most tobacco vending machines, although dumb, have the virtue of being simple. They sell cigarettes only. This makes them easy to supervise, when placed in plain sight of responsible persons. Minors have no business using them. That's simple. Unfortunately, vending machines of newer design can dispense a wide variety of items, including snacks, candy, sundries, and tobacco. This makes them virtually impossible to supervise. Tobacco must not be mixed with other items. This practice, currently rare in Rhode Island, must be prohibited, either voluntarily or by state law.

Of course, the simplest solution to preventing minors from using tobacco vending machines is to ban the machines entirely. Unfortunately, the machines represent a living for some, and they oppose the ban. If a ban is to be politically acceptable, it may have to be phased-in over a number of years, allowing time for the vending machine businesses in the state to adjust.

What Can Physicians Do?

Physicians have a direct stake in the control of tobacco vending machines. As currently placed, with the convenience of the purchaser in mind, these machines are a major source of tobacco for minors. They help get kids addicted to nicotine, an addiction that about 25% of Rhode Island's adults have not yet broken. The rest of the story is well known among medical providers. Tobacco use is a scourge, a major cause of cancer, heart disease, and lung disease.

If we effectively restrict the use of tobacco vending machines by minors, fewer kids will start to use tobacco, and ultimately, fewer adults will continue to use tobacco. This is a task that requires community-wide collaboration. The leadership of physicians is needed at the grassroots level, in cities and towns throughout the state, and at the state level, working for change in the state legislature. One of the best ways to work at the grassroots level is through your local Substance Abuse Prevention Task Force. (Call the Rhode Island Substance Abuse Prevention Task Force Association, 401-568-3212, for more information about the task force in your area.) One of the best ways to work at the state level is through the Coalition on Smoking OR Health. (Call the coalition via the Cancer Society, 401-722-8480, or the Lung Association, 401-421-6487, or the Heart Association, 401-728-5300.) Together, we can make a difference.

THE RHODE ISLAND MEDICAL JOURNAL

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Issued Monthly under the direction of the Publication Committee

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THE RHODE ISLAND MEDICAL JOURNAL HERITAGE

90 Years Ago
March 1905

The lead editorial describes an astonishing new teaching aid called the Zeiss Epidiascope. This exceedingly useful but rare piece of equipment is capable of projecting transparencies upon a white wall; furthermore, one can place a page from a text (or other opaque objects) within the apparatus and have it faithfully projected, enlarged, upon the wall for all present to see. Pages of manuscripts, even insects, dissected organs or physiologic preparations (such as peristaltic movements) may be faithfully enlarged upon the screen. The instrument was purchased through gifts from local physicians and is established in Brown University's anatomical laboratories.

With this 1905 issue, the *Journal* embarks upon a new policy. Henceforth, all Fellows of the Rhode Island Medical Society will receive the *Journal* regularly.

The major scientific contribution consists of a paper, by Professor F.P. Gorham of Brown University, describing the many recent advances contributed by biologists, not only in the advancement of the basic sciences but also by their practical applications in the furtherance of the practice of medicine. Never question, says the author, the intrinsic merit of new scientific information. It may have no immediate applicability but sooner or later it will facilitate some new insight, procedure or methodology. Gorham describes, vividly, the work of Pasteur, Behring, Lister, Ross, Nobbe, Reed, Finlay, Sternberg, Wood and numerous others in transferring basic science observations into practical measures in the prevention or cure of human disease. The author also describes the creative activities of entomologists in finding insect predators to destroy yet other insects that are harmful to various crops. He concludes: "All this looks simple now. The very favorable outlook, however, is due entirely to the work of those biologists who, in a quiet unassuming way, studied blood parasites and mosquitoes, without an idea of the wide fruitfulness of researches, the immediate purposes of which were narrowly defined. And so we are pleased to note that practical men are coming daily to recognize the value of researches which do not appear at first to minister directly to their purposes. On all sides investigations are in progress, inspired solely, in the beginning, by a search for truth, but ultimately leading to the material advance of applied science."

50 Years Ago
March 1945

U.E. Zambarano, MD, superintendent of the Rhode Island Sanatorium at Wallum Lake, writes a review of bronchiectasis, its predisposing causes, common symptoms and therapies. The author describes the limited nonsurgical interventions available and notes that "chemotherapy has not yet proved of great value. Penicillin has not been used extensively enough to draw any valid conclusions."

Bret H. Cotton, MD, describes newer refinements in techiques for the visualization of the bronchial tree (bronchography).

Progress in the surgical treatment of bronchiectasis is summarized by Richard H. Overholt, MD. "Patients with well-localized or single lobe disease may count on complete relief of all symptoms. If it were possible to compare the benefits that accrue from the surgical therapy of all diseases, lobectomy for the properly selected bronchiectatic patient would be well near the top of the list."

The backaches experienced by laborers are analyzed by Henry McCusker, MD. "The vast majority of patients with low-back pains with or without sciatica can be relieved by proper conservative treatment. A small minority of patients with low backache plus recurrent leg pains (formerly known as Chronic Recurring Sciatica) should be considered as ruptured disc suspects until adequate investigation establishes the diagnosis. Operative treatment for removal of the displaced nucleus pulposus in a man doing heavy labor should be done only on selected cases where the neurologic symptoms and signs are very definite and where the lesion can be positively depicted by myelograms. If it is necessary to remove laminae, spinal fusion should be done immediately."

The *Journal* notes that a course in industrial health and hygiene for practicing physicians and nurses is offered every Thursday evening at Brown University.

The section "Doctors at War" contains letters from Rhode Island physicians in the military stationed in such places as the Philippines, New Guinea, the Mariana Islands, the Palau Islands, and various ships at sea.

A book review of a text summarizing an investigation of the marijuana problem in New York City observes the following: "It seems that the technique of keeping "high", that is, in a euphoric state, is difficult. If the user goes beyond this he get decidedly disagreeable results. The practice does not lead to addiction in the medical sense of the term. We get the impression that this whole thing is a tempest in a teapot. Only bums use the stuff and not many of them."

The insecticidal properties of a new agent called DDT are mentioned briefly by the *Journal.*

25 Years Ago
March 1970

The lead article by Thomas A. Johnson, MD, John J. Novosad, BS, and Maurice M. Albala, MD discusses the case and medical management of a 62-year-old black male with a combined hemoglobin C trait and a glucose-6-phosphate dehydrogenase deficiency. Red cell survival in this patient was normal. Radio iron studies,

however, showed moderately ineffective erythropoiesis.

Perfusion chemotherapy in the treatment of melanoma of the extremities is described by C.H. Soderberg, Jr., MD, George V. Coleman, MD, George F. Meissner, MD, Vishram B. Rege, MD and Stephen I. Frater, MD. Their experience with 19 patients is summarized.

Mendell Robinson, MD, writes a paper on noise and its critical relationship to the conservation of hearing.

Herman B. Marks, MD, evaluates visual perception training in children identified with reading disabilities.

In discussing the complications of chronic mastoiditis, Andrew W. Miglets, Jr, MD, and James W. Harrington, MD, note that the widespread use of sulfonamides and antibiotics has decreased the complications of acute otic infections considerably. However, intracranial complications still occur as a result of neglected mastoiditis.

Addendum to Necrology 1994

Harry Maderos Kechijian, MD

Harry Maderos Kechijian, MD, 87, died Jan. 31, 1994, of heart failure, renal failure, and pneumonia.

The son of Maderos and Azniv Hakimian Kechijian, who immigrated from Armenia in 1900, Dr Kechijian was born in Providence on February 19, 1906. Dr Kechijian resided at 33 Dryden Avenue, Pawtucket. He was the husband of the late Annette Rhea Pare who died in 1993. Dr Kechijian graduated from Classical High School with honors. He attended Brown University for 2 years before gaining early acceptance to Tufts University School of Medicine where he was graduated magna cum laude in 1929. He commuted daily from Providence during the 4 years he attended medical school in Boston. He interned at the Memorial Hospital in Pawtucket and practiced general medicine and surgery immediately thereafter for 50 years—on Broad Street in Pawtucket and later on Clay Street in Central Falls. He elected to forgo specialty training after internship in order to pay tuition costs for his two sisters, Natalie Kechijian Jeremiah, MD, and Alice Kechijian Bandeian, MD, and his brother, Kegham Kechijian, DO. He was a member of the American Medical Association, Rhode Island Medical Scoiety, Providence Medical Society, Pawtucket Medical Society, the Massachusetts Medical Society, the American Society of Abdominal Surgeons and the American Society of Anesthesiologists.

He is survived by his son, Paul, a dermatologist in Manhasset, NY, and his two grandchildren as well as nieces and nephews.

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Cover: An 1837 lithograph by Honoré Daumier showing two homeopaths discussing the preparation of their prescriptions.

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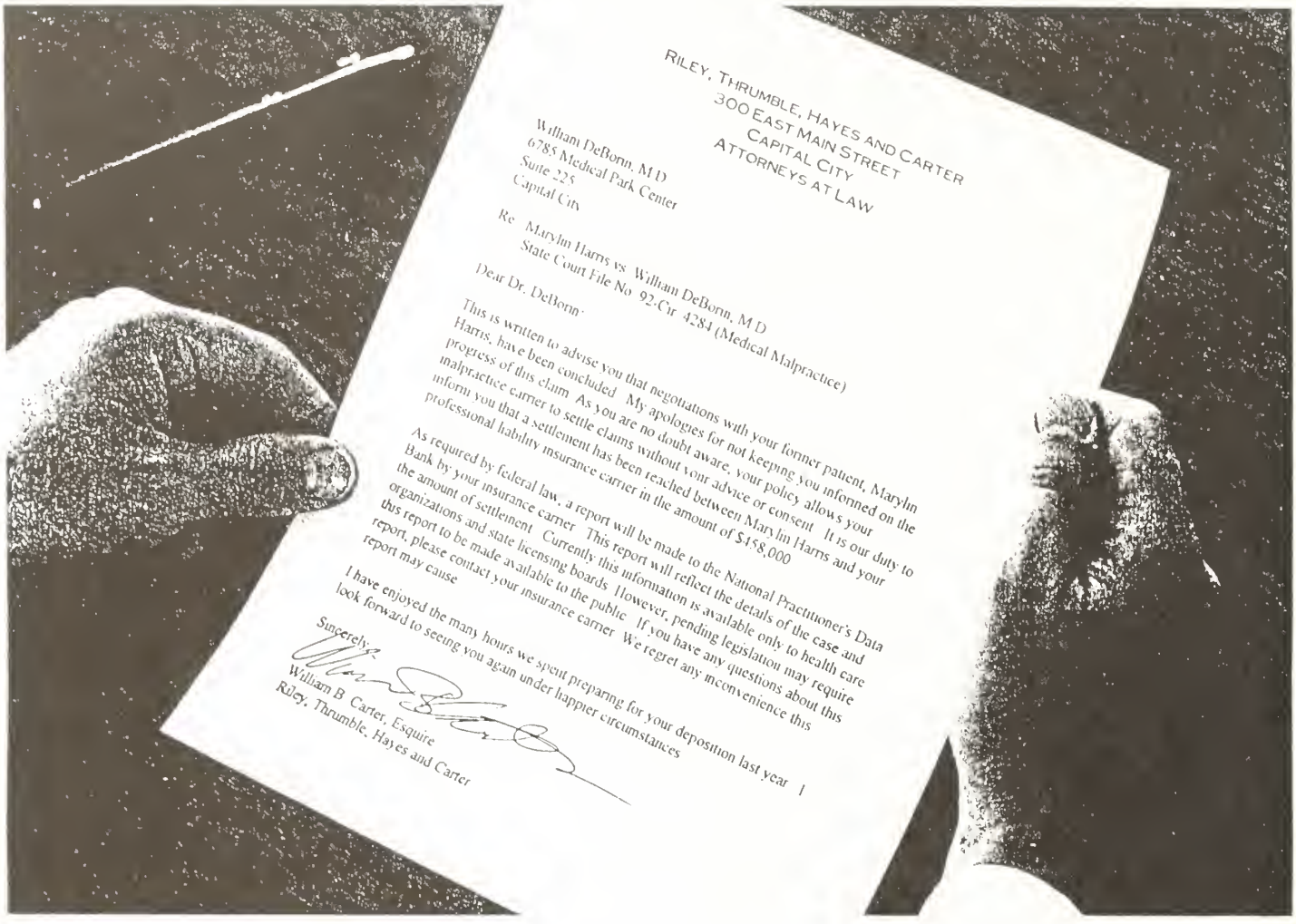
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COMMENTARIES

Patricia A. Nolan, MD, MPH

Rhode Island, during this past century, has been in the forefront of states that acknowledge the critical importance of establishing and maintaining a strong, efficient, centralized and professional department of health. Beginning with the eminent Charles V. Chapin, MD, this state has been blessed with a succession of outstanding public health administrators who have placed the well-being of our community above other considerations.

A new director of health has recently been appointed by Governor Almond and, on March 1, 1995, has assumed the awesome burdens of this post. Her name is Patricia A. Nolan, MD, MPH.

Dr Nolan was granted her MD degree by McGill University, in Canada. Following medical residency, Dr Nolan commenced her training in public health and preventive medicine in the New York City Department of Health. In 1973 she was awarded the MPH degree by Columbia University and in 1975 became Board-certified in Public Health and Preventive Medicine. Dr Nolan was then appointed to a number of increasingly responsible posts in the Illinois Public Health Department. In 1981 she was selected to be health director of Pima County, Arizona, a post she held with great distinction until 1992 when she became executive directorship of the Colorado Department of Health.

Dr Nolan brings to Rhode Island an impressive record and a wealth of rich experience in the management of complex health systems and specifically, the manifold problems of health facilities regulation, quality of care and preventive intervention programs.

RHODE ISLAND MEDICINE earnestly welcomes Dr Nolan to our midst. We wish her many, many years of professional success as she begins her task of addressing the public health ills of this community. The pages of this journal will be open to her observations, her expressions of concern, and her recommendations.

The Names That We Give to Vitamins

By the 19th century, most known diseases had been assigned to one secular cause or another. According to the rationale which prevailed then, a sickness arose when something damaging—a toxin or a parasite, perhaps—assaulted a host. Tangible, positive etiological agents became, therefore, the basis for all tangible organic sicknesses. In 1911 Casimir Funk proposed an exception to this stark axiom: that some diseases might arise because of the *absence* of some dietary factor. His research succeeded in isolating a specific amine-like substance within rice husks that prevented the development of a polyneuritis in experimental chicks and beri-beri in humans. He suggested a novel name for this life-sustaining micronutrient: he called it a Vitamine (Latin, *vita,* meaning life) and speculated that there might be an entire family of such micronutrients each, when insufficient, responsible for some definable illness; and collectively for these deficiency states, he further suggested that they be called the *avitaminoses.* A group of Japanese scientists, also working on beri-beri, had advocated an alternate name, Oryzanin (Greek *oryza,* meaning rice.) Still others recommended that these substances be called "accessory dietary factors." A name meaning life seemed most fitting and vitamin (with the "e" dropped) finally won out. Of course, diseases such as rickets, scurvy, pellagra and beri-beri had been clinically recognized for centuries before the concept of deficiency diseases had been proposed; but—despite much empiric evidence otherwise—they were nevertheless believed to be caused by something added rather than subtracted from the body's economy.

All the currently known vitamins were isolated, defined and synthesized between 1911 and 1948. Although many new vitamins have since been advanced (and visibly heralded in checkout counter publications), none has as yet fulfilled the established criteria. Vitamin B_{12}, isolated in 1948, remains the last proven vitamin.

In the beginning there were but two vitamins: a water-soluble antineuritic substance, called B; and a fat-soluble antixerophthalmic substance, called A. Within a decade a third, L-ascorbic acid, had been isolated and called C. Vitamin A was then shown to contain yet another fat-soluble element that had antirachitic properties and this fraction was then designated as D.

The intentions of the chemical names given to vitamins were modest: to define in Greco-Latin terms some idiosyncratic chemical feature or to describe the original source from which the vitamin had been recovered. These names, hence, are minimally descriptive and, by Madison Avenue standards, even drab. Had the vitamins been named by those wordsmiths who devised names for perfumes (Obsession, Windswept, Shalimar, Opium, etc) the pharmacy shelves might now be displaying a more enlivened, engaging set of dietary essentials. Vitamin B_1, for example, with its synapse-protecting abilities, might have been called *Cogito-Plus* instead of thiamin; while vitamin E, for obvious reasons, might have been named *Machismo-Vit.* It was the community of chemists, however, who provided the vitamins with their cheerless names; their etymologic reasonings are outlined below.

The word, scurvy, was derived from *scorbutus* (Latin, to scratch.) The name for ascorbic acid (vitamin A), was also derived from *scorbutus,* with the added prefix *a-* , meaning not. The provitamin, carotene, gets its name from the Greek, *kara,* meaning head.

The water-soluble polyneuritic protective factor of Eijkman and Funk was shown eventually to be a sulfur-containing dimethylamino-pyrimidine. The name thiamin(e) was ultimately selected (Greek *thion,* meaning brimstone, ie, sulfuric) and

eventually labelled as vitamin B_1. Those seeking the dietary microelement that prevented some forms of experimental dermatitis, growth failure, and alopecia, isolated a sugar-containing yellow enzyme from egg-white. They called this substance riboflavin (the prefix *ribo-* or *ribose* is a corruption of the Latin, *arabinose,* a term which had described the sugar within gum arabic; in time, the meaning of *ribose* was broadened to define all pentose sugars; and *flavus,* a Latin word meaning yellow.) This vitamin fraction had also been called ovoflavin but eventually was assigned the name, vitamin B_2. The substance that prevents pellagra (Latin, *pellis,* skin) was first called vitamin PP (ie, pellagra-preventive) and later, nicotinic acid. This name was then modified to niacin (Vitamin B_3) which represented the acronymic fusion of "ni" from nicotinic, "ac" from acid, and "-in" as a chemical suffix.

Other elements of the vitamin B complex include pantothenic acid, a name reflecting its widespread distribution in nature (Greek, *pantos,* meaning everywhere.) Biotin, deficiency of which causes a dermatosis, was originally called vitamin H (from the German *Haut,* meaning skin.) Vitamin B_6 (3-hydroxy-2-methyl-pyridine) had been isolated from coal tar (and hence uses the Greek root *pyr,* meaning fire.) Folic acid was originally found in spinach and members of this chemical family were then called the folates (Latin *folium,* leaf.) The folates are now consigned to the chemical group called the pteridines (Greek *pteron,* meaning wing, since these yellow pigments were first studied in butterfly wings.) The *pteron* root is preserved in the name of the antineoplastic drug, amethopterin, an important folate analog. Vitamin B_{12}, the antipernicious anemia factor, is chemically a cobalamin (reflecting the presence of cobalt in its molecular structure.)

Fat-soluble vitamin D represents two forms, ergocalciferol (D_2) and cholecalciferol (D_3). The name for vitamin D_2 was chosen to signify that this calcification-generating substance was originally found in a plant steroid called ergosterol (which had been first recovered from ergot). Rickets is probably derived from the Latin, *rachits,* meaning the spine.

Evans and Bishop, in 1924, were seeking to identify a factor in wheat germ that seemed necessary for male fertility in the rat. They called their isolate vitamin E. Emerson later gave it its chemical name of tocopherol (Greek *tokos,* meaning childbirth; *pherein,* to bring forth; and *-ol,* the standard suffix to denote an alcohol.)

Chicks, on a sterol-free diet, frequently develop bleeding diathesis associated with prolonged clotting times. Ultimately, the clotting factors VII, IX and X were shown to be dependent on an adequate intake of a naphthoquinone, later called vitamin K (chosen from the first letter of the German word, *Koagulation.)*

There have been other candidates nominated as vitamins (eg, orotic acid, linoleic acid, even laetrile) but none in recent decades has been elected. The congregation of the rejected include vitamins which had been provisionally labelled as B_{13} to B_{17}, and vitamins L, M, H_3, andU.

The general public is increasingly aware of the vital role of vitamins in their lives, particularly so since vitamin-content is an obligatory piece of information on packaged food products. Vitamin supplementation of everything from breakfast cereals to beers now makes it imperative that we know what is in the foods that we eat or prescribe.

Stanley M. Aronson, MD

How Much Can We Learn From History ?

(This commentary was written by Robert U. Massey, MD, formerly dean of the University of Connecticut School of Medicine, and now professor emeritus of medicine and editor of Connecticut Medicine. *This essay first appeared in the November 1994 issue of* Connecticut Medicine.*)*

Every fall three of us lead a seminar for second-year medical students in the history of medicine. After each session we often conclude that we have learned more than they did. For us the subject is familiar territory for them it is mostly new ground, and because it is new and they are young, the associations they make and the analogies they draw are often new to us. Last week they read a section from Nancy Siraisi's account of medieval and Renaissance medical practice.[1] They were surprised, as students often are, to find that the Middle Ages were not as violent, ignorant, dismal, and dark as they had always assumed. The readings included some long passages from the time of the Crusades up to the 14th century. One student reminded us that we shouldn't interpret too much from these accounts because they were written by and for literate males, mostly in Holy Orders. Another was impressed by, what seemed to her, a remarkably uniform agreement on the purposes and uses of medicine as revealed in these stories of illness, treatment, and expectations.

The first led us to a discussion about communication gaps between doctors and patients, misunderstandings about treatment, confusion about purposes, and the raising of false hopes, all of which have become more serious problems as medical science has grown more complicated, science literacy has declined, and doctors spend less time with their patients. The other matter, that of objectives, excited a lively discussion. Don't we all understand what medicine is about? And isn't our understanding a common one with our patients and with society?

> To cure sometimes, to relieve often, to comfort always.

Is our goal to make a precise pathophysiological diagnosis, to solve The Riddle, as Sherwin Nuland comments in his *How We Die*? Or is it to treat the patient? And when is the patient not a patient but a subject? What about preventing disease, teen-age pregnancy, gang violence? What about research, especially research on extending life? And what about the insurance companies' interests now that they are increasing their hold on medical practice? What about getting patients out of the hospital as soon as possible to save money? What about putting the profits of the HMO ahead of patient needs? What about marketing to increase the demand for medical care? In whose interest does medicine exist, society's or the individual patient's? Some students admitted that even their goals in medicine might not be as clear as they once believed.

Albert Schweitzer's view of medical care would have much in common with Mother Theresa's but little in common with the view of the surgeon-general or a microbiologist in an academic medical center research laboratory. It's easy to say that they all share the same ultimate goals, but do they, in fact? And anyway, the matter of goals and objectives is management talk. In real life you simply do what comes to hand, solving problems one by one, seeing patients one at a time. One student thought that we should think carefully about objectives before health-care reform becomes an issue again, and suggested that it failed this year because those at the table had their own goals in mind and not those of the patients whom they were supposed to be serving.

The medieval doctor seemed to be concerned with maintaining health and perhaps thereby staving off disease and death. He was not unaware of the influence of melancholy, fear, and unrequited love on bringing about sickness, and he knew that exercise, diet, rest, and fresh air were important in maintaining health. He did what he could to restore the balance of humors, believing that thereby health would return. He could foretell death fairly accurately when the illness was mortal, but he knew that his

means to forestall it were meager.

But the past is a different country, as the students soon recognized; there may be only a few lessons to be learned by exploring it. Science and technology have created a different world, better and braver in some ways, worse and more fearful in others. They were surprised to find that in this dark and superstitious, priest-ridden medieval world most disease seemed to be ascribed to natural causes. In a careful study of illness accounts from pre-Crusade Europe, they read that sickness was blamed on sin less than 20% of the time.[2] They concluded that the 20th century was no different, maybe even more inclined to blame the victim. Most admitted that they felt that many patients with drug addiction, alcoholism, lung cancer, chronic lung disease, and AIDS, among others, had only themselves to blame! They tried not to be judges of another's behavior, but they admitted it was not easy.

Like travel, the study of history helps students examine their own surroundings and time and as T.S. Eliot wrote, "to know the place for the first time."

Robert U. Massey, MD

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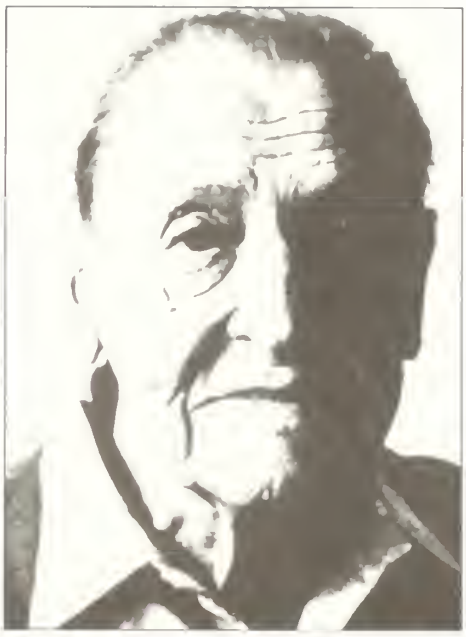
Occupation: Teller of Tales and Physician

William Somerset Maugham was born on January 25, 1874, within the British Embassy in Paris so that, in his mother's words, "He might be born on British soil." His father had been solicitor to the embassy, descended from a long line of English barristers and solicitors traced back through the Malghum family of Westmorland to yet more distant Saxon origins. Maugham, Willie to his family, grew up in Paris, a shy child who, despite a stammering impediment, "had a way with words." When he was 8 his mother died of tuberculosis. Two years later his father died leaving him an orphan. He was shipped back to England, barely able to converse in English, to be adopted by a stern, childless uncle, the church rector in the Kent town of Whitstable. Willie was educated in a Canterbury boarding school, a place "cold as charity" and a source of bitter, lifelong memories.

Within a decade, Maugham and his adoptive family were forced to confront a critical question: What career to choose? His frightful stammering clearly ruled out both the clergy and the courts of law. His frail health eliminated any military career and he lacked either craft or acumen for commerce; thus, with most avenues excluded, Maugham finally chose medicine and in 1892 enrolled in St Thomas's Medical School, the school, 8 decades earlier, which the poet Keats had attended. Maugham selected St Thomas's more because it was situated in London than because he harbored any deep commitment to the healing arts. Maugham had recently discovered the enchantment of the legitimate theater, particularly the stage works of Wilde and Ibsen. Years later he reflected:



W. Somerset Maugham

> "I do not know a better training for a writer than to spend some years in the medical profession. I suppose that you can learn a good deal about human nature in a solicitor's office; but there on the whole you have to deal with men in full control of themselves. They lie perhaps as much as they lie to the doctor, but they lie more consistently, and it may be that for the solicitor it is not so necessary to know the truth."

By 1895 (the year of the Oscar Wilde trial in England and the Dreyfus trial in France), Maugham had completed his first 2 years of medical study in a thoroughly undistinguished manner. All examinations and other requirements were nonetheless met and Maugham then assumed the tasks of the clinical clerk, assigned to the impoverished district of Lambeth just south of the Thames. In later years Maugham describes his obstetrical labors:

> "You dressed and went to the hospital where you found waiting for you the husband or perhaps the small son of the patient, with the card which the woman in labour had earlier obtained from the hospital. The messenger led you through the dark and silent streets of Lambeth, up stinking alleys and into sinister courts where the police hesistated to penetrate, but where your black bag protected you from harm. You were taken to grim houses, on each floor of which a couple of families lived, and shown into a stuffy room, ill-lit with a paraffin lamp."

The grim squalor of late-Victorian London provided Maugham with the narrative and background material for his first published success, *Liza of Lambeth,* a novel in the style of Maupassant and Zola. The book sold well despite reviews which described it as "emphatically unpleasing" and "a mud bath in all the filth of a London street." In 1897 Maugham completed his medical studies and was awarded the degrees MRCS and LRCP but he promptly retreated to "the bloodless haven of literature" and never again formally practiced his profession. Years later, his professor of surgery was asked for his memories of Maugham. "I remember him quite well. Very sad. One of our failures, I'm afraid."

Maugham never returned to St Thomas's except for a brief moment in 1904 when he accompanied his dying brother who had consumed nitric acid in a successful suicide attempt. Rarely, indeed, did he even talk of his medical education except, in jest, to refer to himself as a qualified midwife.

Of Human Bondage, Maugham's first memorable work, is somewhat autobiographical, describing an orphaned youth who eventually attends medical school, but despite much travail and sorrow eventually devotes his life to the practice of medicine. In truth, however, Maugham foreswore any further contact with medicine until the age of 40, in 1917, when he volunteered as an ambulance driver and surgical dresser for the British army battling in Flanders.

In the years following World War I, Maugham's career as a writer and playwright flourished and for a while his fame and income exceeded all other English authors. Some of his novels have physicians as minor characters, often expressing—in wry, resigned terms—a cynical view of life.

> "Everything in life is meaningless, the pain and the suffering are fruitless and futile. There is no object in life. To nature nothing matters but the continuation of the species. And is not this last a hasty proposition based on over-brief periods of time, the observation of an eye that sees but a little way?"

Maugham's was a successful career, spanning two centuries, embracing the Victorian Empire, the sybaritic Edwardian era, two dreadful world wars and the ascendancy of the United States in both the political and literary arenas. He was born in the 34th

year of Victoria's interminable reign—Disraeli was Prime Minister—and died during Lyndon Johnson's presidency. He died in 1965, a lonely, querulous, misogynous, embittered man who had disenfranchised his only offspring. He died, in great wealth, but convinced that the future of man held only degradation.

> "I learnt that men were moved by a savage egoism, that love was only the dirty trick nature played on us to achieve the continuation of the species . . . the world I knew was going from bad to worse and I was pleased as Punch at the thought of my remote descendants, having long forgot art and science and handicraft, cowering skin-clad in caverns as they watched the approach of the cold and eternal night."

It is difficult to view Maugham's immense literary production and dissect out the specific elements which represent insights gained from his medical education. Certainly Maugham himself disparaged the importance of his clinical experiences: "I would not claim for a moment that those years I spent at St Thomas's Hospital gave me a complete knowledge of human nature. I do not suppose anyone can hope to have that. I have been studying it, consciously and unconsciously, for 40 years and I still find men to be unaccountable." On the other hand, medicine may have given this great teller of tales an unblemished window upon reality. "There was neither good nor bad there. There were just facts. It was life." Perhaps, too, the grimness of his Lambeth experiences provided him with a very small measure of humility tinged with dry Anglican humor. In his final few days of life, he said to his nephew, his final companion:

> "Dying is a very dull, dreary affair. And my advice to you is to have nothing whatever to do with it."

Stanley M. Aronson, MD

Scientists Discover New Element

(The following brief message describing an important new scientific discovery appeared recently on INTERNET. It is not clear who the author is although it originated from the following Internet address: <prnmed@halcyon.com>. RHODE ISLAND MEDICINE *is grateful to Milton Hamolsky, MD, for bringing this to our attention.)*

The heaviest element known to science was recently discovered by physicists at the Yale's Research Center. The element, tentatively named administratium, has no protons or electrons and thus has an atomic number of 0. However, it does have one neutron, 125 assistant neutrons, 75 vice-neutrons and 11 assistant vice neutrons. This gives it an atomic mass of 312. These 312 particles are held together in a nucleus by a force that involves the continuous exchange of meson-like particles called morons. *(Addendum from M. Hamolsky, MD: "When in contact with fresh air (0_2), they become oxymorons.")*

Since it has no electrons, administratium is inert. However, it can be detected chemically as it impedes every reaction it comes in contact with. According to the discoverers, a minute amount of administratium caused a reaction to take over 4 days to complete, when it would normally occur in less than a second.

Administratium has a normal life of approximately 3 years, at which time it does not actually decay but, instead, undergoes a reorganization in which assistant neutrons, vice-neutrons and assistant vice-neutrons exchange places. Some studies have shown that the atomic weight usually increases after each reorganization.

Research at other laboratories indicate that administratium occurs naturally in the atmosphere. It tends to concentrate at certain points such as government agencies, large corporations, universities and hospitals and can actually be found in the newest, best maintained buildings.

Scientists point out that administratium is known to be toxic at any level of concentration and can easily destroy any productive reactions where it is allowed to accumulate. Attempts are being made to determine how administratium can be controlled to prevent irreversible damage, but results to date are not promising.

Grass-Roots of Dependency

This commentary is reserved for those who have never intentionally inhaled the smoke of marijuana—or, if confronted, know not even how to spell its name. For those 70-something physicians who equate joints with plumbers, hemp with ships' rigging and pot with kitchen utensils, this summary will offer a brief survey of the psychoactive plant called, variously, hashish, ganja, hemp, pot or marijuana.

The plant which yields marijuana bears the Linnaean name, *Cannabis sativa* (Greek, meaning hemp which is cultivated.) Paleobotanists claim that this hardy weed originated in central Asia, particularly regions of western China and southern Siberia near the Himalayan range. While there is but one species in the genus Cannabis, there are countless variants and cultivars representing centuries of conscious effort in cultivating the plant so as to enhance one or another of its many commercial properties such as its stem (the source of hemp fiber in making rope), its seed (which provides an oil similar to linseed, used as a varnish base) or its leaves and bracts (to yield more of the resin containing euphoriant substances). Cannabis is an annual grass reaching heights of 5 or more meters. It dies each year but its seeds are quite hardy and, unattended, will readily propagate. Its thin, serrated, lancinate leaves radiating in a palmate pattern are easily recognizable (see illustration). It is probably the oldest known plant expressly cultivated for non-food purposes.

Records indicate that hemp had been grown by the Chinese more than 4,000 years ago as their principal source of rope-fiber. The plant found its way to northern India about 3,000 years ago where its mood-altering properties were recognized and incorporated into early Hindu ritual. Three grades of cannabis were employed: *Bhang,* the weakest, used as a decoction or food-additive by the lowest of Indian castes. *Ganja,* derived from the flowering tops of the hemp plant, and of greater potency than *Bhang,* and was either smoked or drunk. And *charas,* the preparation with the highest concentrations of psychoactive agents, akin to the *Hashish* of middle east nations. *Bhang* was incorporated quickly into the Indian pharmacopoeia and was prescribed regularly for headaches, menorrhalgia and seizures.

Foliage of *Cannabis sativa*

Herodotus (450 BC) notes that the hemp plant was brought west by the invading Scythians whose ancestral home had been northwestern India. Hemp plants took root in the territories of the Greek and Roman Empires, but they were exploited only for the production of hemp rope. In the nations of the middle east, however, the mood-altering properties of hemp fulfilled a widespread societal need, particularly in an evolving culture which forbade the use of alco-

holic drinks. In North Africa, cannibis was called *kif;* and in the fertile crescent, it bore the name, *hashish* (Arabic for dried grass). The Venetian, Marco Polo, returned with vivid descriptions of hashish and its psychomimetic capabilities. The *Tales of Scheherazade* make frequent mention of hashish; and a story persisted of a mountain fortress (possibly in Persia) where young males, maintained on hashish, were sent forth periodically to carry out political murders. They were called hashish-eaters from whence came the word assassin. Hemp extract, either eaten or smoked, entered the cultures of various subSaharan African groups. With the Bantus, for example, hemp became the monopoly of the local priests and its use was reserved for religious and initiation ceremonies. Local names for cannabis included *dimba, suma,* and *dagga.* These names persist, today, in eastern Brazil (along with *macumba* and *pango)* where cannabis cultivation was preserved by slaves who had been brought from West Africa in the 16th century.

While cannabis as an intoxicant had spread readily throughout Asia, Africa and South America, Europe (and its North American colonies) remained blissfully ignorant of the pharmacological power of the hemp resins. In 1839 W.B. O'Shaughnessy, an Irish physician who had practiced in northern India returned to England and published the first treatise in English on cannabis therapies. He employed cannabis leaves in his practice to relieve pain, reduce muscle spasms, lessen headaches and abort convulsions. For a short while, the drug was widely prescribed (under the name, *Cannabis indica*) both in England and New England. Its use in the practice of medicine gradually diminished, largely because the potency of the herb (still imported from India) varied dramatically from shipment to shipment. Furthermore, the resin was insoluble in water and hence could not be injected (in contrast to the the newly isolated anodyne, morphine.) A French physician Jacque-Joseph Moreau, following numerous trips to Egypt and neighboring lands, commenced studies on the physiological effects of cannabis, publishing his extensive observations in 1845. Moreau's study-subjects included himself. His text describes his personal reactions to the drug: "My hearing was fantastically sharpened. I heard the sound of colors—green, red, blue and yellow sounds in perfectly distinct waves . . . an overturned glass echoed through me like thunder." His descriptions of psychic liberation and euphoric hallucinations so affected some of his literary friends (including Gautier, Dumas, Baudelaire and others) that they organized a "hashish" club.

At the beginning of the 20th century, cannabis extract, as a mood-modifying drug, was essentially unknown in English-speaking North America, except as an obscure patent medicine (Tilden's Extract of Cannabis extolled as a cough suppressant for those with consumption.) Some contemporary texts on therapeutics listed *Cannabis indica,* describing it as an antispasmotic and anodyne; but with the growing availability of the opiates, bromides and barbiturates, there was little call for cannabis.

In South America, in the Caribbean islands and across the border in Mexico, however, the recreational uses of cannabis continued to flourish. By the beginning of the 20th century some of this product inevitably trickled into the southern ports, particularly New Orleans (which became, literally, the entre-pot of cannabis), and into the border cities of Texas. Cannabis carried many names (hemp, ganja, hashish); increasingly it became identified with fantasy, sexual license and a counterculture liberation from rules. Mary Jane, the name of the archetypal prostitute, was transferred to the cannabis weed, using the Spanish spelling "Marijuana" as its now universal name. Yet another Mexican synonym, *grifa,* accompanied the product across the border but was gradually corrupted to the word, reefer. The use of marijuana then spread rapidly amongst urban African-Americans and professional musicians of the South. Marijuana stayed as an ethnically confined diversion until the early years of the great depression when its clientele widened to include the broader entertainment industry, artists and pockets of campus-based intellectuals. In 1937, the United States passed a law (The Marihuana Act) declaring cannabis to be a hazardous narcotic (the Federal government continues to spell it with an "h."). Pot, in the words of one Shakespearean actor, was now out of joint. Despite (or because of) its assignment to the roster of illegal agents, marijuana found a still more diversified audience following World War II, particularly amongst adolescent students seeking some sort of Dionysian experience or as a way of making an ideological statement. By the 1960s, only a minority of college students could claim not to have experimented with this substance, and its widespread use had given new meanings to such words as "buzz," "stoned" and "high times." Jamaica, Mexico and Colombia provided the principal sources of this illegal product. Domestic production accounted for an estimated 20% of the local market.

The names given to marijuana are many: for the raw product, bo-bo, Aunt Mary, weed, catnip, pot, hash, red dirt, texas tea; and for marijuana cigarettes, reefer, nail, Thai sticks, joint and ju-ju. An habitual smoker is called a grasshopper, freak, pothead or hayburner. The resinous content, containing the pharmacologically active element delta tetrahydrocannabinol (THC), varies from product to product. Those with concentrations over 1% bear special names (and prices) such as Acapulco Gold, Panama Red, Afghani hash, Brazilian Black and Colombian Gold. Growers have noted that when the female plant (*Cannabis* is a dioecious herb) is not allowed to form seed (ie, grown in the absence of male hemp plants), the THC content of the bracts and young leaves rises substantially. This creates a much sought-after product called *Sensemilla* (Spanish, without seeds) with THC concentration rising above 1%. Hashish, however, is substantially more concentrated, typically containing 4%—10% THC, thus accounting for its striking hallucinogenic properties. Its principal commercial sources include Nepal, Lebanon, Syria and Afghanistan.

Why has the use of marijuana now reached pandemic proportions in the developed nations of the world? For millenia this drug has been an accepted part of many non-Western religions and has been a social relaxant for untold millions in Asia; clearly, then, this is not some transient whim, like swallowing goldfish, which can be ignored until it is supplanted by some new idiocy. Theophile Gautier, in 1846, following his experiences with hashish, stated: "The yearning for an ideal is so powerful in man that he strives as much as possible to loosen the ties which link the spirit to the body; and since a pure mystical experience is out of the reach of most of us, man will drink joy, he will smoke oblivion and will eat folly, under the form of wine, of tobacco and of hashish." Not much change seems to have taken place in 150 years.

Stanley M. Aronson, MD

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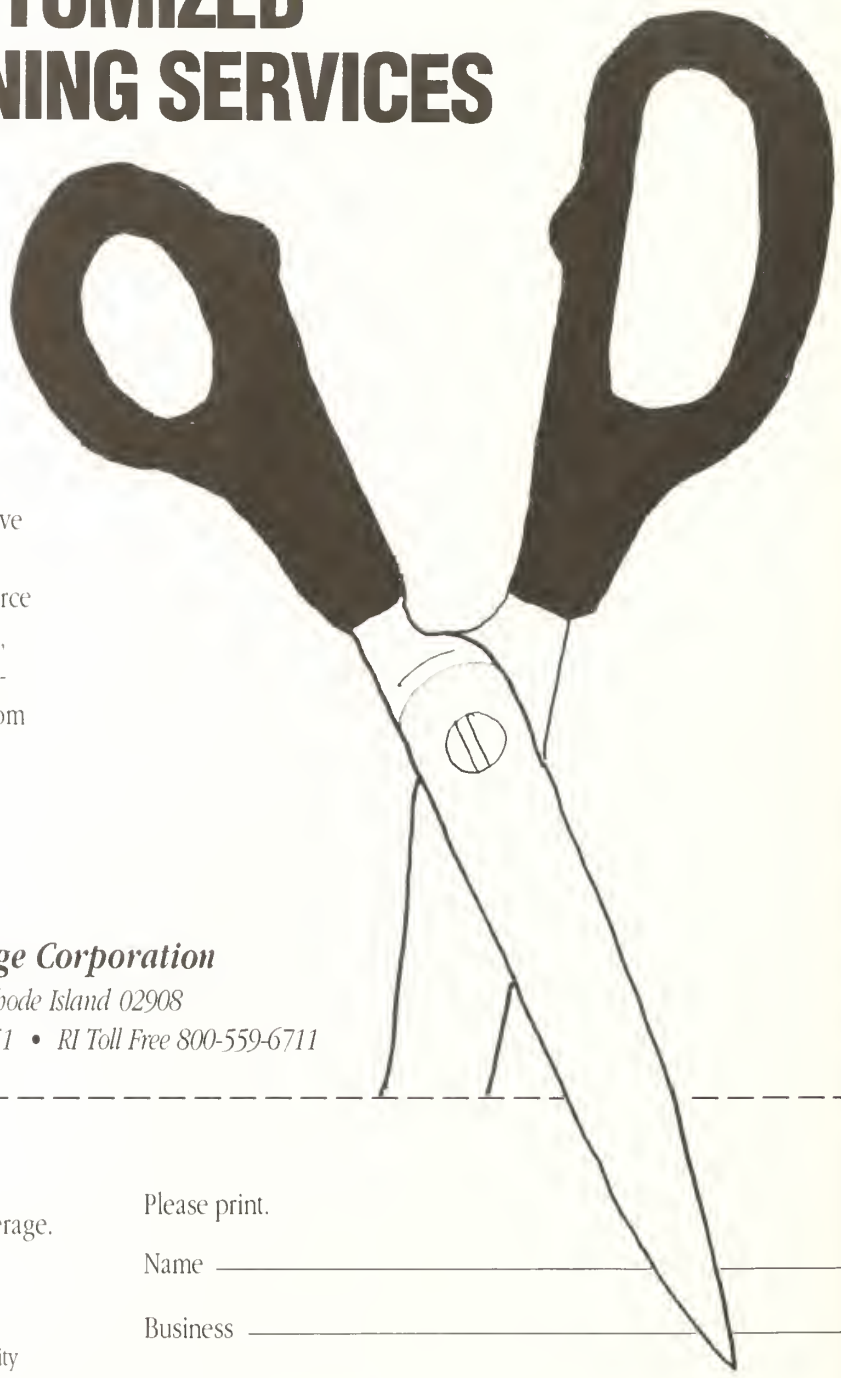

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Public Health in RI: A Strategic Allocation Perspective

William J. Waters Jr., PhD

If the nation is to achieve its full potential for better health, public policy must focus directly and actively on those factors that represent the root determinants of death and disability.

The Potential of Public Health

The potential of public health has been painted in great detail over the last 6 years. In 1988 the prestigious Institute of Medicine published a landmark report entitled *The Future Of Public Health*.[1] The Institute of Medicine Report defines the mission of public health as "the fulfillment of society's interest in assuring the conditions in which people can be healthy." The substance of public health, the report states, is "organized community efforts aimed at the prevention of disease and promotion of health. It links many disciplines and rests upon the scientific core of epidemiology." Further, the report describes the core functions of public health as: "assessment, policy development and assurance." Of key importance, the report also noted that "states are and must be the central force in public health. They bear primary public sector responsibility for health."

Table 1.—Healthy People 2000 Priority Areas

HEALTH PROMOTION
1. Physical Activity and Fitness
2. Nutrition
3. Tobacco
4. Alcohol and Other Drugs
5. Family Planning
6. Mental Health and Mental Disorders
7. Violent and Abusive Behavior
8. Educational and Community-Based Programs

HEALTH PROTECTION
9. Unintentional Injuries
10. Occupational Safety and Health
11. Environmental Health
12. Food and Drug Safety
13. Oral Health

PREVENTIVE SERVICES
14. Maternal and Infant Health
15. Heart Disease and Stroke
16. Cancer
17. Diabetes and Chronic Disabling Conditions 18. HIV Infection
19. Sexually Transmitted Diseases
20. Immunization and Infectious Diseases
21. Clinical Preventive Services

SURVEILLANCE AND DATA SYSTEMS
22. Surveillance and Data Systems

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Against this positive view of the potential of public health, the report painted a rather bleak picture of the current practice of public health: "this nation has lost sight of its public health goals and has allowed the system of public health activities to fall into disarray. We have let down our public health guard as a nation, and the health of the public is unnecessarily threatened as a result."

In 1990 another landmark document concerning the potential of public health was published by the US Public Health Service. Entitled *Healthy People 2000: National Health Promotion and Disease Prevention Objectives,* the report "offers a vision for the new century, characterized by significant reductions in preventable death and disability, enhanced quality of life, and greatly reduced disparities in the health status of populations within our society."[2] The report offers 300 objectives to be achieved by the year 2000, organized into 22 priority areas (Table 1). The priority areas are further organized into four broad categories: "health promotion, health protection, preventive services and surveillance & data systems." The Healthy People 2000 plan states that "the nation continues to be burdened by preventable illness, injury and disability" and that "mobilizing the considerable energies and creativity of the nation in the interest of disease prevention and health promotion is an economic imperative."

The health care reform debate of the past 2 years has also helped to clarify the potential contribution of public health.

In an effort to identify the unique contributions of public health, the US Public Health Service (PHS) in 1993 articulated 10 "Core Public Health Functions" for population-wide services (Table 2).[3] In this same paper, the PHS also pointed out that our nation is currently investing less than 1% of its $1 trillion dollar national health care expenditure on population-based public health functions. This paper concludes by stating, "Health care reform cannot meet its national cost containment targets if sufficient attention is not devoted to prevention of unnecessary health programs."

Finally, in November 1993, Drs J. Michael McGinnis and William H. Foege published a review article in the *Journal of the American Medical Association* entitled "Actual Causes of Death in the United States."[2] By reviewing existing studies, the authors concluded that 50% of the nation's mortality is due to nine factors, most of which are rooted in personal/social behavior patterns: "tobacco, diet/activity, alcohol, microbial agents, toxic agents, firearms, sexual behavior, motor vehicles and illicit use of drugs" (Table 3). This paper concludes by stating that: "If the nation is to achieve its full potential for better health, public policy must focus directly and actively on those factors that represent the root determinants of death and disability." This means a greater investment in public health prevention activities.

Table 2.—Core Public Health Functions: Population-Wide Services

1. Health status monitoring and disease surveillance
2. Investigation and control of diseases and injuries
3. Protection of environment, workplaces, housing, food, and water
4. Laboratory services to support disease control and environmental protection
5. Health education and information
6. Community mobilization for health-related issues
7. Targeted outreach and linkage to personal services
8. Health services quality assurance and accountability
9. Training and education of public health professionals
10. Leadership, policy planning, and administration

In summary, authoritative reports of the last 6 years ascribe enormous potential for

ABBREVIATIONS USED
AIDS: Acquired immune deficiency syndrome
FTE: Full time equivalent (positions)
HMO: Health Maintenance Organization
STD: Sexually transmitted disease
WIC: Women Infants and Children (program)

Table 3.—Actual Causes of Death in the United States in 1990

Cause	Deaths Estimated No.	Percentage of Total deaths
Tobacco	400,000	19
Diet/activity patterns	300,000	14
Alcohol	100,000	5
Microbial agents	90,000	4
Toxic agents	60,000	3
Firearms	35,000	2
Sexual behavior	30,000	1
Motor vehicles	25,000	1
Illicit use of drugs	20,000	<1
Total	1,060,000	50

Table 4.—Department of Health General Revenue Expenditures

Fiscal Year	Appropriation	% Change
1989	$25,800,976	
1990	24,831,413	–3.8%
1991	19,134,419	–22.9%
1992	18,410,120	–3.8%
1993	19,334,293	+5.0%
1994*	18,656,731	–3.5%
1995**	18,051,488	–3.3%
Total Change 1989–1995		**–30.0%**

* Revised Appropriation
** Enacted Appropriation

official public health activities to prevent disease and promote health. However, these same reports point out a huge gap between the potential of public health to improve life and our nation's relatively minuscule investment in public health activities. Thus, the great potential of public health depends on a rather modest increase in our public health resources. The strategic thinking is clearly there. What we need now is the strategic investment that should follow.

Public Health Resources

The three main sources of financial support for public health activities in Rhode Island are: state appropriations that are based on general state tax revenue; state-restricted receipt accounts that are based on specific fees or special taxes, and federal grant funds that are received on a competitive or formula basis. Over the past decade, revenue from state-restricted receipt accounts and federal grants has been growing, but state general revenue support has peaked and declined (Figure 1). This presents a serious challenge to public health since restricted receipts and federal grants are usually earmarked for specific purposes while state general revenue remains the main source of flexible support for infrastructure.

In fact, state general revenue support for the Department of Health peaked in fiscal 1989 at around $26 million and has now dropped to around $18 million dollars in fiscal 1995, a 30% decline in state general revenue support over that six year period (Table 4) . For example, in fiscal 1990, 89.7% of the Health Laboratory's budget was supported by state appropriations. Today only 28.6% of the Health Laboratory's budget is supported by state appropriations.

In the tense struggle over limited state resources that has been taking place over the last 10 years, the Department of Health has not fared well. From fiscal 1985 to 1995, state general revenue appropriations as a whole have increased 65% and the state Medicaid appropriation has increased by over 100%. Yet the state general revenue appropriation for the Department of Health has declined by 20% (Figure 2). This represents a lopsided investment strategy in curative services to the detriment of disease prevention and health promotion programs—a far cry from the nationally articulated notions of the future of public health.

At the present time, the state of Rhode Island is only investing about 1% of its general revenue appropriation on official public health programs. This does not even come close to representing "an ounce of prevention" (1 ounce equals 6% of a pound). If we truly believe an ounce of prevention is worth a pound of cure, we would be making a stronger investment in public health.

The Gaps in Public Health Investment

Serious gaps in Rhode Island's public health infrastructure have manifested them-

Table 5.—Work Requirements

Division: Office/Program	Existing State Requirements	Existing Federal Requirements	Optimal Program
	Percentage Met		
Office of Medical Examiner	95	N/A	73
Health Policy & Planning	50	90	25
Management Services	95	95	85
Vital Records	100	100	85
Environmental Health			
Food Protection	45	85	30
Drinking Water Quality	28	67	56
Occupational Health	50	100	60
Health Laboratories	95	95	85
Disease Control			
Communicable Disease	90	70	80
AIDS/STD	95	100	98
Environmental Health Risk Assessment	10	80	40
Preventive Health Services			
Chronic Disease Prevention & Health Promotion	90	95	75
Primary Care	95	55	20
School & Worksite Health	50	80	40
Oral Health	N/A	N/A	10
Family Health			
Maternal & Child Health	90	95	75
Children with Special Needs	60	95	70
WIC	90	80	65
Health Services Regulation			
Facilities Regulation	65	95	70
Professional Regulation	100	100	90
Drug Control	50	100	60
Board of Medical Licensure and Discipline	95	N/A	95
Average	**73.23%**	**88.26%**	**63.04%**

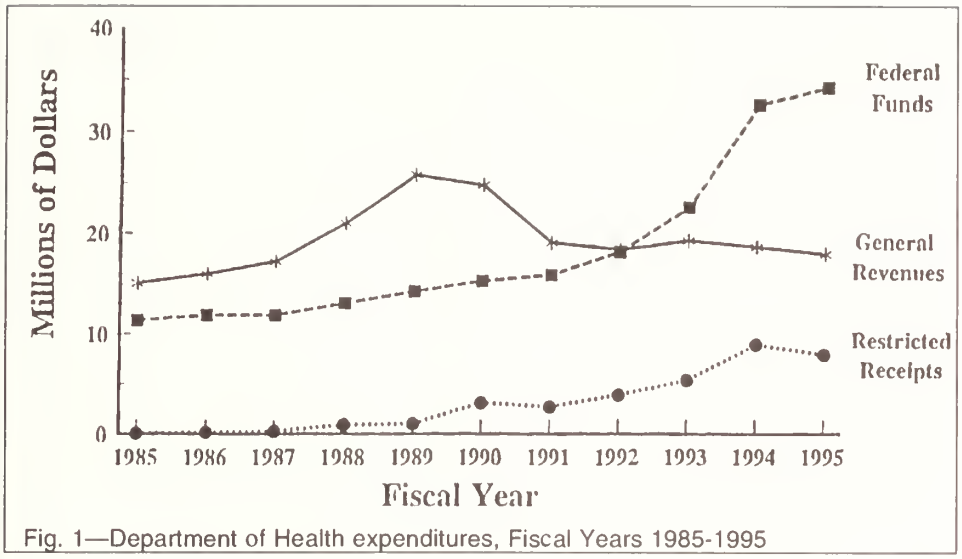

Fig. 1—Department of Health expenditures, Fiscal Years 1985-1995

selves in a number of recent surveys. In April 1993, the Rhode Island Department of Health participated in a study of Core Public Health Functions conducted by the US Centers for Disease Control & Prevention. This survey attempted to identify the amount of money currently devoted to Core Public Health Functions and to estimate an "acceptable" and a "desirable" amount. The Rhode Island Department of Health estimated these figures as follows: current total investment was $43.5 million, acceptable investment was $63.6 million, and desirable investment was $82.7 million. In other words, the Rhode Island Department of Health estimated in 1993 that it needed to double its investment in Core Public Health Functions in order to achieve a desirable level of performance.

In December 1993, the health department conducted an internal survey to identify statutory/regulatory requirements that were not being met. This survey identified substantial gaps in statutory/regulatory work requirements. Major gaps were identified in disease control, childhood nutrition, drug control, licensing of health care facilities, water quality, food protection & sanitation, health laboratories, health statistics and other areas. In fact, this preliminary survey identified the need for an additional $6 million including 94 full-time equivalent (FTE) positions just to meet existing statutory/regulatory requirements within the department.

In September 1994, the health department surveyed its main offices to estimate what *percentage* of existing state requirements, existing federal requirements, and "optimal" programs were being met. On average, the responses indicated that only 73% of existing state requirements, 88% of existing federal requirements, and only 63% of "optimal" program requirements were being met (Table 5). Based on this assessment the programs which are experiencing the largest gaps are: health policy & planning, food protection, drinking water quality, occupational health, environmental health risk assessment, primary care, school & worksite health, oral health, and drug control. Overall, the results indicate the fact that the infrastructure of public health is thin and weak in many areas.

Finally, the Office of Disease Prevention and Health Promotion of the US Public Health Service estimated in 1993 that the cost of making Core Public Health Functions "fully effective" would be about $100 per capita. In Rhode Island, the current total public health expenditure is around $60 per capita counting all federal and state sources of funds. This leaves a gap of $40 dollars per capita. However, the $40 per capita gap represents only 1% of the state's total per capita health expenditure of about $4,000. If, in fact, we were devoting $100 per capita to Core Public Health Functions, that would still only represent an extremely modest 2.5% of the total health expenditure in Rhode Island—not exactly what you would call profligate spending.

Financial Options

Additional public health financial resources could be raised in a number of ways. One way to do it would be through cigarette and alcohol taxes. This would be justified on the basis that tobacco and alcohol are directly linked with so many of the major public health problems of our times: tobacco is linked with heart disease, cancer, and stroke—the three leading causes of death; and alcohol is linked with intentional and unintentional injuries such as homicide, suicide, highway fatalities and falls, which taken together represent the fourth leading cause of death. According to the national Behavioral Risk Factor Surveillance Survey, Rhode Island ranks third in chronic alcohol drinking.

In Rhode Island, cigarettes are currently heavily taxed compared to other states, but state taxes as a percentage of retail price has been dropping since 1975. In 1975, state tax represented 41% of the retail price of cigarettes. In 1993, state tax was only 19% of the retail price of cigarettes—a 54% decline.

While Rhode Island ranks relatively high in tobacco taxes, the state ranks relatively low in terms of taxes on alcohol. Rhode Island ranks 15th for taxes on liquor, 25th for taxes on wine and only 40th for taxes on beer. Obviously, there is room here for resource development. Another potential source of funding for public health would be private health insurance and health maintenance organization (HMO) premiums. One could make a strong argument that all private health insurance and HMO premiums should be tapped a small percent to

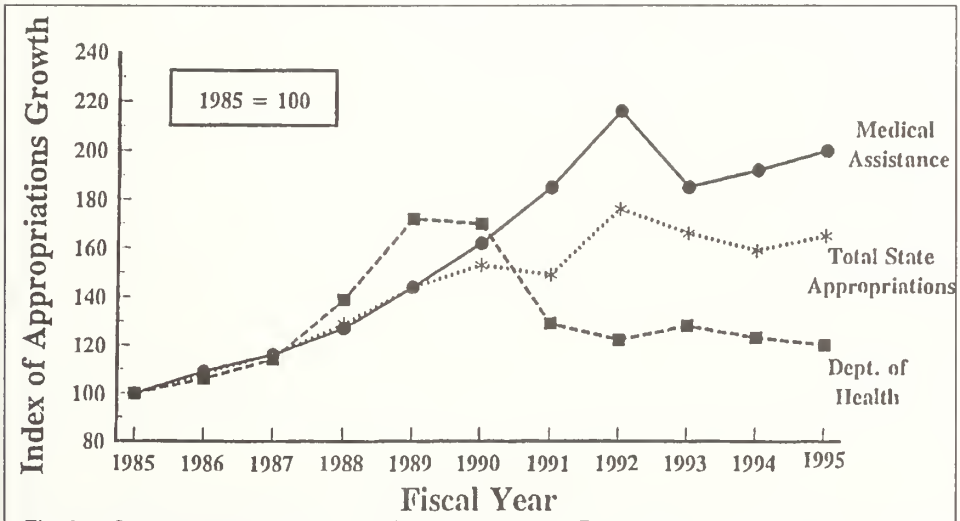

Fig 2.—State appropriations: medical assistance, Department of Health, and total, fiscal years 1985-1995.

help pay for Core Public Health functions. After all, all private health insurance and HMO premium payers benefit from the preventive effect of public health services. In the absence of public health programs, private health insurance and HMO premiums would be considerably higher. The amount of cigarette, alcohol and private health insurance/HMO expenditures that would be needed to close the $40 million gap in Rhode Island public health programs would be relatively modest. In fact, the $40 million gap represents only 2.6% of all these expenditures taken together. These same options were recently included in a report by the Partnership for Prevention entitled "How To Fund Public Health Activities."[3] There are other options available as well, such as Medicaid and Medicare set-asides and increased appropriations. Herman M. Biggs, a public health leader, said that "public health was purchasable." He was right.

In sum, there are things that can be done to make a more appropriate investment in public health. In the end, it depends on whether we have the will to match widespread rhetorical support for prevention with a relatively modest allocation ($100 million total) of our overall health expenditures ($4 billion) in Rhode Island.

. . . the US Public Health Service estimated in 1993 that the cost of making Core Public Health Functions "fully effective" would be about $100 per capita.

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Technology and the Cost of Medical Care

Louis R.M. DelGuerico, MD, FACS, FCCM

Gammon's Law: "In a bureaucratic system . . . increase in expenditure will be matched by fall in production."

There is no doubt that medical technology, including pharmaceuticals, has dramatically increased the cost of health care over the past 50 years. However, I wish to show that it is only one of six such factors and the only one which actually improves medical care and upgrades the efficiency of doctors and nurses. The other five causes are: the rise of for-profit hospitals and HMOs; malpractice turmoil and the practice of defensive medicine; administrative bloat; overregulation of all aspects of medical care; and finally, the cost-plus practices of the health insurance industry. This insidious invasion of what was once primarily a charitable and voluntary enterprise is best explained by the writings of Adam Smith, the 18th century economic philosopher, describing the "invisible hand" of the profit motive which manipulates a nation's economy. My own interpretation is that in a democratic society, any system that is highly successful creates an insatiable demand which in turn spawns other ventures aimed at taking a share of the wealth without necessarily contributing to efficiency or productivity. In regard to federal health care reform, Adam Smith pointed out that the profit motive usually wins out against state action. An example is Representative Dan Rostenkowski's recent compromise with the Health Insurance Association of America.

Before World War II, medicine contributed little to the actual quality of life and most people had a fatalistic attitude towards disease and injury.[1] Then progress in the form of "half-way medical technology" described by the late great medical philosopher, Lewis Thomas, allowed blue babies to survive, the crippled to walk with artificial hips and executives to play 18 holes of golf angina-free with new coronary arteries. Public awareness of these and other medical wonders led to what Arnold Relman, then editor of the *New England Journal of Medicine*, in 1980 described as the medical-industrial complex.[2]

For a while in the 1970s it was thought that the efficiencies of American big business could hold down hospital costs. Since then it's been shown that investor-owned hospitals charge 15% to 20% more than the voluntary hospitals do.[3] They have to since they pay taxes, dividends and have marketing costs. Two-thirds of the HMOs today are also for-profit institutions. They and the commercial hospital chains listed in the Jan.

Agencies that demand carefully controlled trials to approve new drugs and procedures exempt themselves from assessment of the value of new regulations.

1, 1994 *Forbes* magazine produced an average annual 17.7% return on stockholders equity and 31.9% earnings per share growth over the past 5 years. Adam Smith would be pleased to see his theories in action.

Medical malpractice produces medical inflation both directly and indirectly. Tillinghast's 1991 report *Tort Cost Trends* estimated that only 42% of the $9.1 billion yearly direct medical malpractice expense actually gets to the injured patient. Even in Indiana, the state with the best record of tort reforms, a Hudson Institute study of malpractice costs at a major hospital there found that liability added $450 to every admission. Indirect costs caused by product liability, unnecessary tests and referrals resulting from the practice of defensive medicine are a problem only in the United States, the one country which allows contingency fees. *Webster's International Unabridged Dictionary* states that from the earliest times the offense of *champerty* (the quaint legal term for contingency fees) was forbidden and punishable. When lawyers dominated the Congress and state legislatures in the 19th century, *champerty* was legalized. *Barratry*, the act of inciting and encouraging lawsuits was outlawed in English Common Law and even Roman law. Today, American attorneys plead for clients on TV and radio. L. Gordon Corvitz of the *Wall Street Journal* and Walter Olson of the Manhattan Institute have documented how detrimental these practices are to the medical economy.[4] The recently inaugurated National Practitioner Data Bank, which maintains a computerized permanent record of every complaint and judgment against physicians, will compel even more defensive medicine and worse, will constrain doctors from taking on difficult or complicated patients.

For an explanation of administrative contributions to medical inflation, Milton Friedman in the *Wall Street Journal*, cited Gammon's Law: "In a bureaucratic system . . . increase in expenditure will be matched by fall in production." Friedman pointed out that from 1946 to 1989, "hospital personnel per occupied bed multiplied nearly sevenfold."[5] Last year, in a *New England Journal of Medicine* special article, three Harvard researchers reported that, nationwide, 24.8% of hospital spending was due to administrators and clerks.[6] Furthermore, in 1968 there were 435,000 of them supervising 1,378,000 patients, but by 1990 their number had risen to 1,222,000 and the inpatient population had shrunk to 853,000. Unfortunately, many of these individuals are turncoat doctors and nurses with clipboards who belong at the bedside with stethoscopes.

Various experts have estimated the cost of federal and state hospital regulation at between 25% and 40% of the total. Agencies which demand carefully controlled trials to approve new drugs and procedures exempt themselves from assessment of the

ABBREVIATIONS USED
HMO: Health Maintenance Organization

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value of new regulations. Politicians have ignored the law of diminishing returns in promising a risk-free society as pointed out last year by Steven Breyer, the new appointee to the Supreme Court, "Efforts to regulate small risks to health care are plagued by serious problems of tunnel vision, random agenda selection, and inconsistency."[7] The Roman satirist Juvenal put it best, "Sed quis custodiet ipsos custodes?" (But who will guard the guardians?) As a matter of fact, Stephen Shortell and Edward Hughes, in a 1988 study for the National Center for Health Services Research, showed that those states with the most stringent hospital regulations had 6% to 10% higher death rates.[8]

Finally the health insurance industry must share the blame. *The New York Times* of April 4, 1994 reported that Aetna, one of the largest medical insurers, lost $400 million in personal and business property policies but had profits of $290 million on their health business. The *Times* cited "bloated expenses, aggravated by years of lethargy and heavy losses in real estate, junk bonds, catastrophes and environmental claims." That's a heavy load shared by health insurance premiums. Even so, *Forbes* reports that the average profit margin for 27 of the largest health insurers in 1993 was 9.6% and the return on stockholders equity was 15%.

Medical technology bashing is unjustified and has a chilling effect on progress towards future discoveries and their benefits.

True to Adam Smith's theories, millions of executives, lawyers, administrators, government regulators and stockholders as well as doctors and nurses are making a good living from the sick and injured. Medical technology bashing is unjustified and has a chilling effect on progress towards future discoveries and their benefits.

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Preventive Health Attitudes and Practices Of Elderly Persons Attending Senior Centers

Alison A. Moore, MD, MPH, Carol Dorros, MD,
Douglas P. Kiel, MD, MPH, Patricia S. O'Sullivan, EdD,
and Rebecca A. Silliman, MD, PhD

The findings of this study suggest that senior centers may be ideal sites for both educating and providing preventive health services to the elderly.

Among the elderly, health behaviors and preventive services may decrease morbidity and mortality from acute and chronic disease and may also reduce or postpone a decline in functioning. Many professional societies and task forces have recommended specific preventive health measures to be considered for the elderly such as bi-annual measurement of blood pressure and yearly influenza vaccination.[1-7] Adherence to these measures, however, varies widely. Most studies report suboptimal rates of participation in disease prevention/health promotion activities.[8-14]

Senior centers are sites where community-dwelling older persons may participate in a variety of social, educational and physical activities.[15] Many centers also focus on health and offer educational programs and limited preventive health services. We surveyed persons attending senior centers to determine: 1) how important they perceived specific preventive health behaviors and services to be; 2) if they participated in these preventive health activities or received these services more often than other elderly cohorts; and 3) barriers to participating in these preventive health activities. We also surveyed senior centers to ascertain what services they offered.

Methods

Three hundred senior center participants in six Rhode Island centers each completed a questionnaire asking about eight preventive health behaviors and interventions recommended for older persons: seat belt use, influenza vaccination, exercise, blood pressure measurement, mammography, and breast, pelvic and eye examinations. For each of the preventive health measures, we asked: 1) how important the behavior was (using a 4-point scale ranging from very important to not important at all); 2) whether they engaged in the behavior or received the intervention; and, if not, 3) what barriers they perceived (both open- and close-ended responses possible). All senior centers are located in Providence or surrounding towns. We obtained information from each center on the availability of health services and educational programs, staff health care professionals, and transportation to health care appointments.

. . . most of the centers were staffed with health care professionals and had a readily available means of transportation to health care appointments.

Because most respondents reported each of the health behaviors as very important and a small minority reported the behaviors as not important at all, we collapsed the data on the four rated categories of importance into two categories, important vs not important, for our analysis of the relationship between the respondents' rating of importance and reported practice of a particular health behavior. Chi square tests ($P<0.05$ being considered significant) were used to assess the strength of the association between variables. ANOVA was used to determine if there were differences between groups on continuously sorted variables. Logistic regression analysis was used to describe the relationships among dichotomous outcome variables and explanatory covariates.

Results

The survey response rate was 100%. Most respondents were female (75%), Caucasian (83%), and had completed some high school (81%); 45% were widowed and 48% reported less than $10,000 annual income. The mean age of respondents was 73.5 years (SD 7.1). Seventy-five percent of respondents rated their health as excellent or good; 95% reported having a personal physician; and 93% reported that they had someone to rely on when they needed help.

Between 71% and 99% of respondents rated each of the health behaviors important (Figure 1). The percent of respondents who reported participating in the studied preventive health activities varied from 66%-98% with the exception of influenza vaccination (46%). There were no significant differences among centers in either the perceived importance or reported practice of each of the behaviors. While a respondent's attitude towards and practice of each of the health behaviors was related ($P<0.05$), age, gender, income and educational level were not related to health behavior.

Although most respondents adhered to the studied preventive health measures, 6%-24% of the pertinent respondents reported at least one barrier to obtaining influenza vaccination, mammography, breast and pelvic examinations, and using seat belts and exercising (Table 1). Non-adhering subjects reported ineffectiveness and discomfort as the major reason for not obtaining flu shots (n=77 non-adhering) or using seat belts (n=90); physical disability or fear of injury were the reasons most often given for not exercising (n=39). Not being offered or recommended the examination were the most common reasons given for non-adherence with mammography (n=19) and breast (n=14) and pelvic examinations (n=21).

All centers had educational programs addressing the importance of exercise, blood pressure control and regular eye examinations. Four of the six centers provided influenza vaccinations and had programs to encourage breast cancer screening and seat belt safety, while two centers had similar programs for cervical cancer screening. Five centers had staff health care professionals available to see center members from half day a week to 5 days a week and three centers had vans to take center participants to health care visits. Neither the availability of specific health programs, nor other en-

ABBREVIATION USED
ANOVA: Analysis of variance

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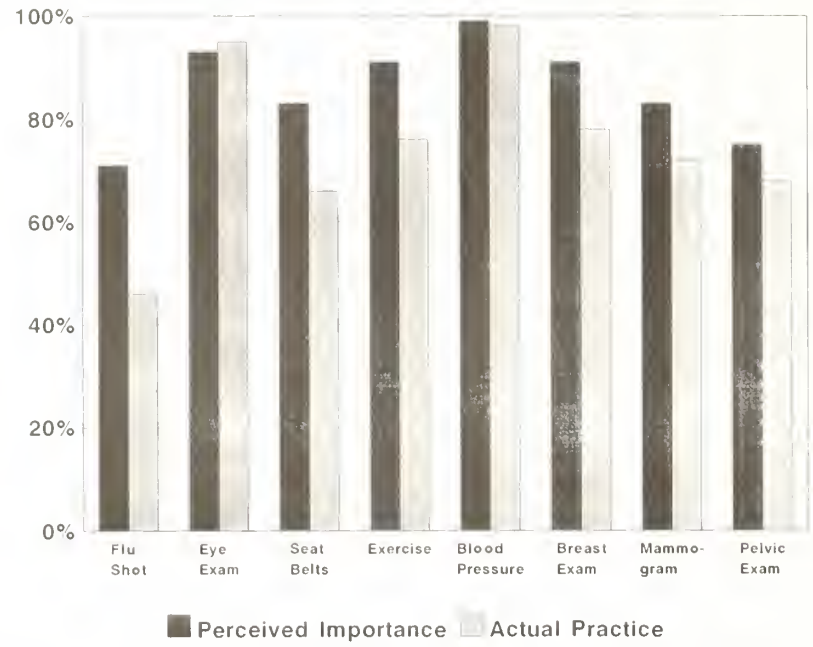

Fig 1.—Percent of respondents who rated a particular health practice important compared to those who reported engaging in the same health practice.

abling factors such as on-site health care professionals or transportation to health care visits predicted a respondent's likelihood of believing a specific health behavior/intervention important or engaging in that activity.

Discussion

Elderly study participants who attended senior centers in Rhode Island both considered a variety of preventive health activities important and reported engaging in them. These participation rates are generally higher than those reported by previous studies.[8-14] For example, among a random sample of persons older than 65 years, 21% reported wearing seatbelts regularly and 23% reported exercising regularly.[9] Among women at least 65 years of age, various studies report rates of mammogram utilization and physician breast examination of 10%-46% and 53%-69% respectively.[10-12,14] It is possible that both the health education focus and available services at the senior centers and the characteristics of persons who attend senior centers explain these encouraging results.

Since all centers offered some preventive health education and services, these older respondents may have received this education and had easy access to many of the preventive health services studied. To further facilitate preventive health care for seniors, most of the centers were staffed with health care professionals and had a readily available means of transportation to health care appointments. The importance of senior centers in promoting and facilitating good preventive health care is illustrated by the respondents from Center 4. This center had the most comprehensive array of preventive health programs, a nurse at the center on weekdays, and could transport their members to health care appointments. This center serves a primarily African-American, low income group of elderly, a population which is among the least likely to engage in health promotional activities.[16] This group, however, reported particularly high rates of belief in and compliance with the studied preventive health behaviors.

Most survey respondents reported good health and social support and a regular source of medical care. In addition, as members of a senior center, they are all involved in a community organization. All these factors are associated with use of health care services and participation in health-promoting activities.[8,11-13,17,18] Efforts to increase participation in senior centers might effectively increase health promotion activities among many groups of older persons. More diverse populations, including sicker, more functionally disabled persons, could be targeted by developing outreach programs.

Although barriers to participating in preventive health activities were infrequently reported by these seniors, most non-adherers reported that their physician did not offer or recommend the examination. Physicians may fail to consistently promote preventive health because of time constraints in the office, inadequate preventive health cueing systems or both disagreement with and unawareness of the current recommendations regarding health promotion/disease

Table 1.—Barriers to Preventive Health Practice

Practice	Barriers	N	(%)*
Flu Shot n=160 (54%)**	Makes you sick	52	(34%)
	Not offered	25	(16%)
	Not recommended	24	(16%)
	Hate shots	22	(14%)
	Allergy	17	(11%)
Seat Belts n=95 (34%)	Uncomfortable	40	(44%)
	Increase injury	26	(29%)
	Difficult to use	18	(20%)
	Does not prevent injury	6	(7%)
	Other	12	(13%)
Exercise n=71 (24%)	Physically unable	28	(45%)
	Afraid of injury	11	(18%)
	No facility	8	(13%)
	Other	13	(21%)
Breast Exam n=45 (23%)	Not offered	14	(38%)
	Too old to need	13	(35%)
	Uncomfortable	9	(24%)
	Embarrassing	5	(14%)
Mammogram n=55 (28%)	Not recommended	19	(45%)
	Too old to need	12	(29%)
	Uncomfortable	6	(14%)
Pelvic Exam n=63 (32%)	Not recommended	21	(40%)
	Too old to need	11	(21%)
	Embarrassing	10	(19%)
	Uncomfortable	8	(15%)

* total percentage may be >100% because respondents could give more than one response

** indicates the percentage of respondents who have not engaged in the behavior

prevention.[19,20] Physicians might be more successful if they delegated the delivery of many preventive health services to senior center staff health care providers rather than providing them during a typical office visit when other medical care concerns may overshadow preventive health care issues.

Physicians might be more successful if they delegated the delivery of many preventive health services to senior center health care providers rather than providing them during a typical office visit when other medical care concerns may overshadow preventive health care issues.

The findings of this study suggest that senior centers may be ideal sites for both educating and providing preventive health services to the elderly. However, these results may not be generalizable to other populations since the data were obtained from a convenience sample of generally well, elderly persons attending senior centers. As members of a social group, they may have been more likely to report agreement with socially desirable behaviors. Another weakness of the study is that the data were self-reported and there was no external validation of answers. Despite these limitations, we report high rates of participation in a variety of preventive health measures and belief in their efficacy among a group of elderly people attending senior centers in Rhode Island. Further studies of senior centers as sites for preventive health education and provision of health services are needed to substantiate our findings.

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The Faces of Hospice

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Hospice Care of Rhode Island

169 George St. Pawtucket, RI 02860 (401) 727-7070

Inpatient Hospice Care: A New Option for the Terminally Ill

Edward W. Martin, MD

The Hulitar inpatient unit was specifically created to offer an alternative for those terminally ill patients . . . who can not be care for at home.

When St. Christopher's Hospice opened in England in 1967, it represented the beginning of organized hospice care for the terminally ill. Hospice care in the United States began a decade later, in Connecticut, primarily as a home-based effort detached from hospitals and the medical establishment. As the hospice concept expanded, offering comprehensive palliative care to its patients, it continued to maintain its roots in the home while becoming increasingly accepted by physicians. This arrangement served most patients well; nevertheless there were a small number who were unable to benefit from this. For some, care in the home setting was inappropriate and at times even impossible. Occasionally this was due to the severity of their symptoms; at other times because their caregivers were unable to render the necessary care at home; and at still other times because no caretaker at all was available. Many of these patients ended up in a hospital, a place expressly designed to provide acute care needs while often incapable of meeting the social and emotional needs of the dying patient and his family. Yet other terminally ill patients remained at home in situations that were woefully suboptimal. In response to this need, Hospice Care of Rhode Island established an inpatient facility, the Philip Hulitar Center. Since late 1993, terminally ill patients are now offered another choice.

Table 1.—Hospice Care of Rhode Island Hulitar Center Diagnoses on Admission (378 admissions)

Diagnosis		
Cancer	312	(83%
AIDS	13	(3%)
Other (see text)	53	(14%)

The Hulitar inpatient unit was created to offer an alternative for terminally ill patients who can not be cared for at home, while in the final days of their illness or during an interval of unstable symptoms. The unit was designed to provide aggressive attention to symptom control as well as comprehensive psychological, emotional and spiritual support in a warm and caring environment. Attractively decorated and functionally optimal rooms were established with the patient and his family in mind. The ceilings are high, the windows are large, overlooking gardens, and pullout couches are available so that family members may stay with their loved one overnight. And while each room possesses all of the customary hospital equipment, the forbidding hospital ambience is absent. Each room is attractively decorated as though it were a private bedroom. The care is individualized so that families can retain their role as caregivers or, alternatively, the Hulitar staff can take up this role in part or in entirety. Visiting is permitted at any time and children are encouraged to visit. Pets are permitted.

Fig 1.—Each patient room has a character and decorative motif of its own. The canopied frame carefully hides a functional hospital bed. Large windows face a landscaped terrace.

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Fig 2.—Family room, Hulitar Hospice Unit

The unit is well staffed to provide the comprehensive care required by terminally ill patients. The 10-patient unit has two nurses and two nursing assistants on every shift. There also is a nurse coordinator, fulltime social worker, chaplain, secretary and many volunteers in daily attendance. Hospice physicians see the patients daily and the patient's primary physician is welcome to participate as the treating physician.

In 1994, the first full year of operation, 378 patients, aged 25 to 95 years, were admitted to the unit. Patients came directly from hospital or home, in one of the following categories:

1. Those patients cared for at home who were in the final days of life and whose caregiver could no longer provide the necessary care at home.
2. Those patients cared for at home whose symptoms (eg, pain, agitation, nausea, vomiting) had escalated to a point where home management was no longer possible and the most expeditious resolution of symptoms could best be achieved in an inpatient setting. Many of these patients were able to return home after their stay in the unit.
3. Those hospitalized patients who were dying and who no longer needed the interventions that the acute hospital customarily provides but who could not be cared for at home. Many of these referrals were initiated by hospital utilization review nurses and discharge planners as a way of shortening hospital stays while simultaneously allowing terminally ill patients to be cared for in a more sensitive, appropriate setting.
4. Those hospitalized patients who required vigorous attention to symptom control available in the inpatient unit prior to returning home. When stabilization is reached, they may then return home.

Table 2.—Hospice Care of Rhode Island Hulitar Center Status of 378 Admissions

Status		
Death	295	(78%)
Discharged to home	51	(14%)
Discharged to nursing home	31	(8%)

Of the 378 patients admitted to the unit in 1994, advanced cancer was the most common diagnosis. Many patients with other diagnoses, however, were also cared for in the inpatient unit, including patients with AIDS, irreversible congestive cardiac failure, advanced obstructive pulmonary disease, stroke, Parkinson's disease and organic dementia (Table 1).

Most of the admitted patients (78%) died while in the unit. Their length of stay was extremely variable with some dying within hours of arrival and some surviving for months. Of the discharged patients, most were able to return to their homes. A few, however, did require nursing home placement (Table 2).

The Hospice Care Hulitar Center is open for admissions 24 hours a day, 7 days a week. Besides serving the patients on our Hospice Care program, the center also accepts admissions from emergency rooms, hospitals, nursing homes and other home care agencies. The Philip Hulitar Center is located at 50 Maude St, Providence RI 02908 and their telephone number is (401)351-5570.

The inpatient unit accepts patients without regard for their ability to pay. With many, expenses are covered in part by Medicare, Medicaid and most private insurance programs. Private donations help to offset the expenses.

The inpatient unit offers yet another option to terminally ill patients. While the hospice philosophy still regards the home as the optimal setting for terminal care, it also recognizes that "home" can be created in many settings. For those patients who cannot remain in their own home the unit provides a setting which allows patients to live in cornfort and dignity for whatever time they have remaining.

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HEALTH BY NUMBERS

Rhode Island
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Lead Poisoning Among Rhode Island Preschoolers

The RI Department of Health analyzed blood lead screening data for RI children who will be eligible for Head Start programs in September 1995, to assess the extent of early childhood lead poisoning by municipality. As of September 30, 1994, 14,855 children born between September 1, 1990, and August 31, 1991 (99%), had at least one blood lead (PbB) test result registered in the department's lead screening database. These 14,855 children closely approximate the population from which Head Start programs will enroll students in September 1995, and from which public and private schools will enroll kindergarten students in September 1996. Six percent (927) were found to have blood lead (PbB) levels ≥ 15ug/deciliter of whole blood sometime before 48 months of age and are considered to have been "lead poisoned."

Table 1 shows the volume and yield of PbB screening in the 1990-1991 birth cohort, by place of residence at the time of the last test for each child. Proportions of children with confirmed lead poisoning vary from 0% in towns such as Barrington to 15% in Providence. Cities with proportions above 5%, including Woonsocket (5%), Pawtucket (5%), Central Falls (9%), *and* Providence (15%), have concentrations of old, deteriorated housing with friable lead paint and highly contaminated soil. Fully 62% of the lead poisoned children in this cohort resided in Providence at the time of screening; another 16% lived in Woonsocket, Pawtucket, and Central Falls together.

It is premature to suggest that communities without cases at the time of this analysis do not have children at risk, since testing will continue to identify cases for an additional 24 to 36 months. It is also important to note that delays in confirmatory testing are not randomly distributed, and that, based on unpublished program data, unconfirmed elevated screening tests have a predictive value of 40% to 60%, depending on the prevalence of lead poisoning in the community and the method of collection. When all children in this cohort reach 6 years old and all elevated screening tests have been confirmed with venous blood samples we can determine the true lifetime risk of childhood lead poisoning in RI preschoolers.

Lead poisoning is a major public health problem in Rhode Island, causing significant brain dysfunction in thousands of children. As the Public Health Briefing on Page 121 demonstrates, such dysfunction costs Rhode Island millions of dollars in avoidable special education costs annually. The health department is committed to reducing environmental lead exposure, but needs the help of the entire Rhode Island community in solving this problem. For more information on lead poisoning, blood lead screening, and the medical management of lead poisoned children, call (401) 277–2312 (Division of Family Health, RI Department of Health).

Table 1. Volume and yield of PbB screening, Rhode Island resident children born between 9/1/90 and 8/31/91, by municipality.

City/Town	Number Screened	Number Screened with PbB≥15ug/dl	Number Confirmed with PbB≥15ug/dl	% of All Screened Confirmed with PbB≥15ug/dl
Barrington	259	4	0	0
Bristol	289	12	3	1
Burrillville	176	11	3	2
Central Falls	446	104	41	9
Charlestown	92	3	1	1
Coventry	248	11	1	0
Cranston	793	62	17	2
Cumberland	310	22	7	2
E. Greenwich	93	2	1	1
E. Providence	626	43	4	1
Exeter	57	5	0	0
Foster	55	2	1	2
Glocester	89	8	1	1
Hopkinton	80	4	1	1
Jamestown	66	6	0	0
Johnston	288	18	5	2
Lincoln	192	10	2	1
Little Compton	45	3	0	0
Middletown	245	8	3	1
N. Kingstown	308	10	3	1
N. Providence	318	24	7	2
N. Smithfield	82	4	0	0
Narragansett	193	14	3	2
New Shoreham	26	2	0	0
Newport	486	33	9	2
Pawtucket	1278	155	65	5
Portsmouth	211	4	0	0
Providence	3766	965	573	15
Richmond	82	9	2	2
S. Kingstown	351	29	5	1
Scituate	104	5	0	0
Smithfield	170	7	3	2
Tiverton	182	7	3	2
W. Greenwich	42	2	1	2
W. Warwick	229	20	6	3
Warren	165	7	2	1
Warwick	745	46	18	2
Westerly	182	13	6	3
Woonsocket	918	127	46	5
Unknown	568	132	84	15
State	**14855**	**1953**	**927**	**6**

Submitted by the Office of Health Statistics, Peter R. Simon, MD, MPH, Division of Family Health, and William P. Dundulis, Jr., MS, Lynn Boulay, MS, CIH, and Robert R. Vanderslice, PhD, Office of Environmental Health Risk Assessment. Health by Numbers *is edited by Jay S. Buechner, PhD, and William J. Waters, Jr., PhD*

Public Health Briefings

Rhode Island Department of Health
Patricia A. Nolan, MD, MPH, Director

Edited by Judith Feldman, MD,
John P. Fulton, PhD, and Bela Matyas, MD

Lead Poisoning Among RI Preschoolers: the Cost

Peter R. Simon, MD, MPH, William P. Dundulis, Jr., MS,
Lynn Boulay, MS, CIH, Robert R. Vanderslice, PhD

A young child's brain is particularly vulnerable to the toxic effects of lead.[1] While the major brain structures are formed before birth, significant changes in the connections between brain cells occur through early childhood. Exposures to toxic levels of lead at different stages of development can produce different psychoneurological outcomes.[2] During the early stages of child development, connections between brain cells undergo marked anatomic and physiologic changes. Lead interferes with these processes and can produce clinically observable effects on behavior and learning.[3] After injury, the heightened sensitivity of young brain cell connections to the chemical neurotransmitters required for brain healing may also make the child's brain more sensitive to toxic effects; the same chemical pathways that allow a child to learn or to recover from injury are disrupted by many contaminants, especially lead.[4]

Screening for Blood Lead Among Children

In January 1993, RI regulations requiring annual screening of all children under 72 months of age became effective under the Childhood Lead Poisoning Prevention Act of 1991 (Title 23, Chapter 24.6 of the RI General Laws). By March 1993, all specimens sent to the RI Department of Health Laboratory for lead screening began to be tested directly for lead; the erythrocyte protoporphyrin test used previously was discontinued. Health by Numbers Page 120 examines preliminary results of screening in one cohort of preschool children born between September 1, 1990 and August 31, 1991, who will be entering school no later than the fall of 1996.

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Table 1.—Avoidable cost (1990 dollars) of special education for lead poisoned children (N=1000) in one RI birth cohort.

Relative Risk	No. in Spec Ed* Not Lead Poisoned	No. in Spec Ed Lead Poisoned	Cost of Spec Ed in millions of $ (Yrs of Spec Ed) 3	4	5	6
4.0	150	600	18	24	30	36
3.5	150	525	16	21	26	32
3.0	150	450	14	18	23	27
2.5	150	375	11	15	19	11
2.0	150	300	9	12	15	18
1.5	150	225	7	9	11	14

The Cost of Inactivity

Childhood lead poisoning in RI is responsible for large educational costs. Lead-poisoned children frequently require costly special education to compensate for the resulting intellectual deficits and behavioral problems. For example, one follow-up study of a cohort of lead-exposed children suggested an odds ratio for school failure of seven,[5] with a 40% excess of special education above the low lead-exposed group (a relative risk of 3.5 for receiving special education). Schwartz[6] and Bellinger,[7] in smaller cohort studies, estimated a 20% excess of special education among children with significant lead exposures.

Table 1 shows an estimate of the lifetime avoidable costs of special education attributable to childhood lead poisoning among 1000 lead-poisoned three year olds entering school in 1996. It was assumed that children in need of special education services will be identified as eligible by grade 4, and that they will require 3-6 years of compensatory

Table 2.—Screening guidelines: PbB (blood lead).

Asymptomatic Children: Most children under age 6 should be screened for PbB at intervals no greater than 12 months, with shorter screening intervals for children with previous PbBs ≥ 10 ug/dl and for those who live in environments with high risk of lead exposure. A brief questionnaire is available from the RI Department of Health for evaluating environmental risk. Screening may be discontinued after 36 months of age at the discretion of the provider if the child has been screened according to guidelines until that age, no PbBs have exceeded 15 ug/dl, and no changes in environmental conditions have occurred. Screening is recommended after 72 months of age only for developmentally delayed children.

Symptomatic Children: Symptomatic children are inappropriate candidates for screening; immediate diagnostic testing is recommended.

Further information: 277-1185x145

Table 3.—Medical management guidelines: Pb poisoning.

Diagnosis and possible chelation: Children with positive screening results have venous blood drawn and tested for PbB. Symptoms of lead poisoning are checked and evaluated. PbBs ≥ 45 ug/dl indicate the need for chelation. PbBs ≥ 25 ug/dl and < 45 ug/dl may indicate a need for chelation in young infants and toddlers. The latter is a judgement call. The benefit of chelation for PbBs < 45 ug/dl has not been demonstrated in clinical trials.

Dietary manipulation: Children are put on a diet low in fats and high in protein, iron, and calcium. Full stomachs slow the absorption of lead compounds. Iron and calcium compete with lead compounds for absorption sites.

Environmental management: Children are removed from high-risk residential environments and the environments are made lead safe. **N.B.: It is absolutely essential to remove children from high-risk residential environments if they are undergoing chelation therapy. Chelating agents may promote the absorption of lead compounds if the latter continue to be ingested.**

Further information: Medical management: 277-1185x145
Environmental management: 277-1417

help to remediate learning impairments attributable to lead poisoning, at an average $10,000 per pupil per year in 1990 dollars above the cost of regular education (RI Department of Education). Special education data for 1990-1991 provided by the Office of Special Education of the RI Department of Education for cities and towns with low prevalences of lead poisoning were used to estimate the need for special education among children without lead poisoning; audited costs for special education in 1990-1991 were used to estimate the average marginal cost of special education for a child with a learning disability. *Even if one uses a relative risk as low as 2.0 for special education in lead poisoned children (geometric mean blood lead levels in the range of 15ug per deciliter of whole blood), the lifetime avoidable cost for special education in one RI birth cohort is $9-18 million, with more than one half of the burden falling on the City of Providence.*

A Public Health Crisis Which Demands Action

No fewer than 930 school children who will be of age for school entry in the fall of 1996 have already been identified as having lead levels in their blood that may put them at significantly increased risk of behavioral disorders, learning disabilities, and decreased intelligence. Special education services required to address these deficits are expensive, averaging an excess $10,000 per pupil per year.

Lack of sufficient resources for aggressive childhood lead poisoning prevention has resulted in compensatory special education costs. Increased lead screening and laboratory sensitivity over the past two years have revealed a public health crisis which demands action, to assure that children no longer suffer this entirely preventable injury.

Solutions to this problem are ultimately tied to the availability of safe, affordable housing and other environments frequented by preschool aged children. Standards requiring paint, particularly lead-based paint, to be intact must be enforced. Such minimum standards for housing have been in place since the late 1970s in RI. These standards were recently updated under the authority of the RI Lead Poisoning Prevention Act to include lead hazards posed by lead contaminated soil, dust, and water.

Publicly funded housing assistance programs and municipal minimum housing agencies must be given the resources and direction necessary to enforce these standards as a high priority. Such funding and high priority have been integral to the successful removal of lead hazards from publicly owned housing. Families who live in private sector rental units should be assured of dwellings free of lead hazards.

Health care providers, parents, property owners, mortgage bankers, and retailers must be thoroughly informed about lead hazards. Renovations which create dust during the scraping or sanding of lead-based paint have resulted in dangerously high lead levels among inhabitants, as well as among those performing the work. Under RI law, *those who perform interior work which disturbs lead paint must be licensed lead hazard reduction contractors.* Parents must know where lead hazards exist and how to protect their children from these hazards.

Further information about childhood lead poisoning, as well as lists of certified lead inspectors and licensed lead abatement contractors, are available in English and Spanish by calling the RI Department of Health (401-277-1417). Information about financial assistance for lead hazard abatement is available through local housing offices or by calling the RI Housing and Mortgage Finance Corporation (401-751-5566). Information on childhood lead screening and the medical management of lead-poisoned children may be obtained by calling the RI Department of Health (see Tables 2 and 3). Regulations for exterior lead paint removal are available from the RI Department of Environmental Management (401-277-2808).

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90 Years Ago
April 1905

The bulk of this issue is occupied by the proceedings of a symposium "On The Venereal Peril." The lead article discusses the history and bacteriology of venereal disease and is written by Dr F.T.Fulton. The origins of venereal disease, he notes, are not recorded in history. But, quoting one writer: "Syphilis, the daughter of prostitution, was born as soon as commerce instead of love presided over the exchanges of caresses." The author fails to find much on this subject in the medical literature before the 15th century. "The absence of any accurate description of the diseases of venery in the earlier medical writings," he speculates, "may be explained by the existence of an excessive prudery." Nevertheless he tends to agree that syphilis, at least, was not prominent in Europe until the French invasion of Naples and that the original infection may have been brought from the New World by the sailors of Columbus. No syphilis was recorded in the Atlantic colonies until 1646 when " . . . virtuous people were much grieved by the discovery of a disease in Boston with which until then they were entirely unacquainted; this proved to be *Lues Venerea."* Finally, the author states that the essential transmitting agent of syphilis is still unknown." *[Ed. Note: The Treponema pallidum was first described by Schaudinn and Hoffman in 1905.]* H. Terry, MD, provides a detailed description of the genito-urinary aspects of venereal disease, emphasizing the effects of gonorrhea in both male and female. He stresses the following: "In the vast majority of cases the disease is caught from women *not* inmates of houses of prostitution." G.T. Swarts, MD, discusses the dermatological features of syphilis, stating that "When a universal macular eruption appears the patient becomes alarmed and then consults a general practitioner or a dermatologist." He notes soberly that venereal diseases constitute one-eighth of all the diseases treated in hospitals. And he quotes others who avow that 23% of Parisian hospital inpatients are luetic. G.W. Porter, MD summarizes the gynecological aspects, particularly of gonorrhea. He concludes: "Some diseases affect directly only the subjects of them, but in gonorrhea others suffer also. How many a virtuous, trusting and unsuspicious young wife has had all the happiness of her life destroyed, often without ever knowing the cause, partly by physical suffering and partly by being deprived of what is to her one of the dearest things in life, the possibility of motherhood." S.A.Welch, MD, F.T. Rogers, MD, H. DeWolf, MD and G.L. Shattuck, MD discuss, respectively, the internal medical, the ophthalmological, the pediatric and the neurological faces of the venereal diseases. The systemic components of syphilis, particularly the cardiovascular and the tertiary central nervous system syndromes, are reviewed; and neonatal gonorrheal conjunctivitis—with its devastating sequelae—is considered.

Charles V. Chapin, MD, provides a summary health report for Providence covering the winter of 1904-05. The death rate continues to fall, reaching 19.8 per thousand citizens. He notes that there were only 12 deaths from influenza that winter although there were 53 cases, and 6 deaths, from diphtheria. Also, only 17 cases of typhoid fever reported. The leading mortality causes continue to be tuberculous consumption, scarlet fever and diarrheal diseases.

50 Years Ago
April 1945

In the lead article, G.E. Crane, MD, discusses the classification, diagnosis, immediate triage management and ultimate therapy of acute knee injuries. In this orthopedic category, the author considers simple traumatic synovitis; injuries to the internal lateral ligament, the internal semilunar cartilage and the cruciate ligament; osteochondritis dessicans; osteochondroma; and Osgood-Schlager's disease.

John Farrell, executive secretary of the Rhode Island Medical Society, in response to an appeal that naturopathic "physicians" be licensed in Rhode Island, writes a detailed description of the various naturopathic schools in the United States, their curriculum, their entrance qualifications, and their faculty. Naturopathy is defined as a system of therapeutics in which neither surgical nor medical agents are used, dependence being placed only on natural forces. The author concludes that "naturopathy appears in every instance to be nothing more than part of the course given for the training of chiropractors."

The lead editorial expresses grave reservations with the Kenny treatment of poliomyelitis. The editorial states: "Enough cases were seen in which Kenny treatment was given very early to demonstrate that this does not prevent or even minimize the degree of permanent paralysis."

A committee of the Medical Society comprised of Alex Burgess, B. Earle Clark and Harmon Jordan explored the feasibility of establishing a Rhode Island Institute of Pathology to provide pooled laboratory skills for all the hospitals of the state acting also as a central locus for basic research initiated by and for the hospitals. The committee expressed unanimous approval of the concept.

The monthly section entitled "Doctors at War" carries a touching story of Commander William P. Davis, during the invasion of the island of Mindoro, meeting up with his son, Neal, who was an elisted Navy man with the invading convoy.

25 Years Ago
April 1970

Frank Seixas, MD, a national authority on the medical treatment of alcoholism, writes a paper entitled Medical Education and a Community Approach to

Alcoholism. After summarizing the various community-based efforts to stem alcoholism, he concludes:

"Alcoholism has relevance not only for the treatment opportunity it presents in our present stage of knowledge. There is a further bonus. Elucidation of the physiology and pathophysiology of alcohol and alcoholism is not yet complete and presents a fertile research opportunity with current investigative methods. The recent discoveries of alcohol's prime role in creating the fatty liver, of depressing bone marrow, and of starting myopathies including cardiomyopathy are to be noted. The studies of altered metabolism of catecholamines on ingestion of alcohol remain to be enlarged on as pointers toward an eventual biological or pharmacological aid or cure."

H. Denman Scott, MD, coordinator for the "Wipe Out German Measles" campaign, writes an article outlining the unequivocal success achieved by this statewide rubella vacination effort. The effort required more than 3,000 professional and lay volunteers working through 425 immunization clinics.

The role of the hospital in the community is outlined in a paper by David J. Fish, MD. He observes, ". . . because the problems that face medicine today are multifaceted, involving almost every segment of society, it becomes increasingly necessary to broaden the base of our decision-making process and our operant structure."

Arnold Porter, MD, discussing physician service in 1969, advocates that physicians be appointed to hospital boards of trustees particularly because of their cumulative skills and their unique perspective on hospital problems.

John T. Connell, MD, describes the elements of the anaphylactic reaction and some primitive—but life-saving—measures to be undertaken.

Editorial subjects include an historic summary of rubella infection and its role in congenital realformations. Other topics include a discussion of Medicare, and the concept of extended care.

The president of the Medical Society, Richard P. Sexton, MD provides his presidential message discussing the importance of striving to reduce medical expenses so as ". . . to present the best possible care at the lowest reasonable cost."

Information for Contributors

Manuscripts - Manuscripts will be accepted for consideration with the understanding that they are original contributions, have never been published in its current form, and are submitted only to *Rhode Island Medicine*. An article should address a substantive issue of interest to the Rhode Island medical community. Articles may be no more than 3000 words in length and have no more than 20 references.

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Books:

2. Hollingworth JW. *Local and Systemic Complications of Rheumatoid Arthritis*. Philadelphia, Pa: Saunders; 1968.

Book Chapter

3. Epstein WL. Erythema nodosum. In: Samter M, ed. *Immunological Diseases*, 2nd ed. Boston, Mass.: Little, Brown; 1971;2:944-951.

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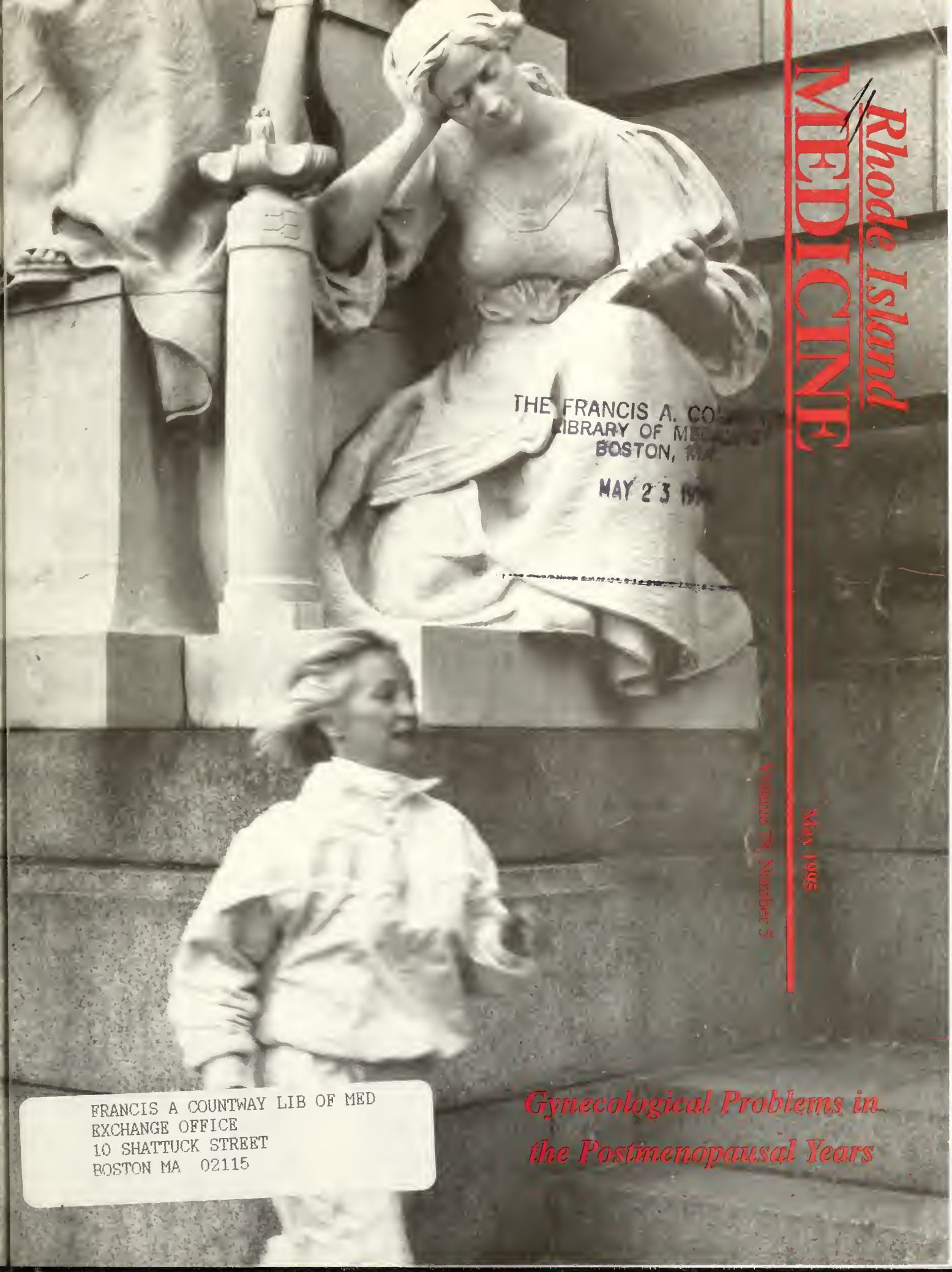

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Gynecological Problems in the Postmenopausal Years

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Cover: Photograph from the archives of Women & Infants Hospital showing a healthy middle-aged woman who preserves her youthful appearance with exercise as she jogs past a statue representing the sedentary lifestyle of a prior era.

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COMMENTARIES

First Things First

Doctor, I have no time to worry about myself. I have my family to think about first. Their problems and needs are much more important than mine."

These and similar responses are frequently heard by physicians who treat women. Any number of priorities manage to consume the energies of these self-sacrificing individuals. The order of priorities seems to read as follows: children, husband, parents, siblings, friends, fellow church parishioners, neighbors, and somewhere way at the end of the list is the patient herself.

Society has placed women at the very center of the traditional family unit. She is the caregiver and the caretaker of those fortunate to receive her warm, tender attentions. Locked away in the very private recesses of our individual memories, are those moments when we needed someone's touch and gentle ministrations. When the times of need were the greatest, there was a mother, grandmother, sister or wife reaching out, unselfishly eager to fulfill those needs. How lucky we were to be the recipients of this love. But how often were those tireless efforts, so freely given by the loving giver at the expense of her own health needs.

We need no reminder that delays in diagnosis and institution of appropriate therapy can have an indelible influence on the eventual outcome of any clinical situation. Delay on the part of the sufferer towards active response in a medical situation has a way of self-propagating until the situation becomes desperate. All too often the result is a diminishing potential for successful therapy.

As physicians to women, particularly older women with an escalating host of responsibilities fueled by the passing of time, we must be constantly vigilant to this likelihood for delay. We must search carefully for the unvoiced symptoms and situations. The office encounter must be an unhurried opportunity to deepen our relationship with the patient, creating a secure atmosphere of confidence and understanding that invites open dialogue. We must be alert to follow up suggestive symptomatology to its conclusion, and not allow procrastination or delay to supervene. The more open and sensitive our demeanor, the more likely we will be received as a secure confidant, and the more likely we will be able to serve that patient comprehensively.

When serious disease threatens to undermine the health of the center of the family unit, the challenge of discovery and institution of appropriate therapy is clearly ours. By responding to this challenge we affect the well-being of the patient before us. But in a broader sense we affect the future well-being of all those fortunate individuals whose lives are touched in such a meaningful way by this very special human being.
Neil D. Jackson, MD, FACOG

Syndrome!

In the 16th century, a Greek word entered the vocabulary of medicine. The word was *syndrome*, denoting a concourse or concurrence of many things (*syn-*, meaning together with; and *dromos*, meaning a running, as in words such as dromedary or aerodrome). It appeared first in Copeland's 1541 translation of Galen. By the 19th century, the word was employed more narrowly to define the aggregate of signs and symptoms associated with a specific disease. Someone with great clinical insight, of course, was required to recognize that seemingly unrelated signs and symptoms arising in separate organs represented manifestations of but a single process or disease. Even when we are mindful of the underlying molecular defect, it is often easier to identify each of these symptomcomplexes simply by the name of its discoverer. The eponym, "Wolman's syndrome," for example, takes less time to say than "cholesterol ester hydrolase deficiency syndrome." Understandably, the great majority of syndromes continue to remain eponymic.

Predictably, the continued reliance upon surnames for the syndromes led to some confusion. We have Pigeon-Breeder's, Gamekeeper's Thumb and Carpet Layer's Knee syndromes representing selective occupational hazards. But along the way we also encounter Farmer's, Shepherd's, Milkman's, Baker's and Gardener's syndromes each bearing the family names of their discoverers rather than the trades suggested by such titles. To complicate things further, we also come upon the Alcoholic Rose Gardener's syndrome (published in 1964, it describes sporotrichosis of the radial tendon sheath, the organism being introduced by a puncturing thorn while the marginally anesthetized gardener, busy with his roses, labors under the influence of alcohol). We also have syndromes named after physicians (Israel's, Berlin's, Poland's, Turk's) while still other illnesses bear authentic geographic names (Balkan nephritis, Chinese Restaurant, Tangier syndromes). Some syndromes bear the names of true saints (St. Agatha's, St. Agnon's, St. Anthony's, St. Avertin's). Saint's triad syndrome, however, honors a most secular South African professor of surgery named Saint who described the concordance of hiatus hernia, gall stones and colonic diverticuli. A modest number of syndromic triads, in addition to Saint's, abound in the formal medical literature: Gram's, Abeshause's, Charcot's and Hutchinson's triads, but only one tetrad (Tetralogy of Fallot syndrome). A further dilemma lessens the value of eponyms. When a patient is said, for example, to have Charcot's syndrome, what indeed does he suffer from? In their zeal to honor the great French clinician, his assistants named seven separate syndromes after him, including carotid sinus syncope, intermittent biliary fever, multiple sclerosis, intermittent claudication, visual agnosia, syphilitic arthropathy and peroneal muscular atrophy.

Standard medical dictionaries list about 600 discrete syndromes. Magalini and Scrascia (*Dictionary of Medical Syndromes*) explored the medical literature more rigorously and assembled more than 2,700 published syndromes. Many are part of the everyday discourse of medicine such as Reynaud's or Meniere's or Cushing's syndromes. A few are noteworthy because of the novelty of their given names, the narrowness of their populations at risk, their

ambiguity or some other feature distinguishing them from conventional syndromes.

Take, for example, Aarskag's syndrome describing a pediatric disorder consisting of short stature, facial dysplasia and genital anomalies, transmitted as an X-linked, recessive trait. In any compendium of syndromes—thus far at least—Aarskag's is invariably the first to be listed, representing therefore a unique incentive for someone (an Aageson or an Aaronson, perhaps) to come up with a new, hitherto undescribed syndrome, thus displacing Aarskag's singular position at the head of the line. The syndrome with the lengthiest name is Acrocephalopolysyndactyly III, better known, for obvious reasons, as Apert's syndrome.

Classical images have been exploited in describing a number of syndromes. Those based on mythological or literary characters carry a built-in synopsis regarding the medical nature of the syndrome, in contrast to real eponyms that often provide no clue. Some literary allusions are obvious (Othello syndrome describing paranoid jealousy or Lady Macbeth syndrome describing compulsive hand washing); others need some familiarity with the text source (Ondine's Curse, Lilliputian, Lazarus, Pickwickian, Munchausen syndromes.)

The works of Professor Charles L. Dodgson (Lewis Carroll) have also been a rich lode for the mining of syndromic metaphors. The Alice in Wonderland syndrome defines the bizarre but transient disturbances in body image recorded in patients with certain forms of epilepsy or migraine. It should be recalled that Dodgson himself was a lifelong sufferer of migraine and may therefore have experienced a transitory sense of body shrinkage during his migrainous episodes. The Cheshire Cat syndrome identifies those patients who nicely fulfill all the diagnostic criteria of a particular organic disease but then confound the issue with a negative biopsy ("I've often seen a cat without a grin," thought Alice, "but a grin without a cat?") And people suffering from chronic mercurialism, whether they are in the felt-curing business or not, are said to have Mad Hatter's syndrome.

Rapunzel was the fairy tale maiden with hair sufficiently long to allow her prince to climb its tresses to reach her tower dungeon. When surgeons, in 1968, encountered two emotionally disturbed adolescent women with small bowel obstruction caused by swallowing their own hair (trichobezoars) they promptly called the disorder the Rapunzel syndrome.

Some appear to be named for birds: Swan's, Gull's and Albatross syndromes. Swan and Gull, of course, were the names of the physicians who first described these medical conditions. The Albatross syndrome, however, hearkens back to Coleridge's ancient mariner ("The shipmates in their sore distress . . . hang the dead seabird round his neck."). Thus, in a somewhat labored allusion, it serves to describe those emotionally disturbed post-gastrectomy patients who continue to haunt their surgeon with real or imagined complaints.

Somewhat more bizarre than most is the "Global Transient Amnesia-Sexual Intercourse syndrome describing the abrupt onset of profound memory loss and disorientation shortly after sexual intercourse. This distressing, but fortunately reversible, syndrome was first described by two Boston neurologists about three decades ago. A virtually identical disorder has also been recorded in England—but, curiously, without coitus listed as a preceding risk factor. (It is difficult to speculate what this says about either England or Boston.) In 1974 a Canadian ophthalmologist enriched the medical literature with a new syndrome defining acute ocular pain arising during coitus in the prone position (ophthalmodynia hypertonica copulationis); the author ascribed the pain to a sudden pressure enhancement of preexisting narrow-angle glaucoma. Those innocents who coined the phrase, "Make love not war" obviously knew not the full risks of making love.

Color; real or otherwise, seems to be a prominent feature in the world of syndromes. There are Yellow-Nail, Blue-Velvet, Red-Diaper, Lingua Nigra, Brown-Recluse (not to be confused with Brown-Sequard), Sea-Blue Histiocyte, Purple-People, and Umber's syndromes. And then there are numerous syndromes whose very names should prompt great curiosity: Beer-Drinker's, Cinderella, Double-Whammy, Mermaid, Honeymoon-Cystitis, Morning Glory, Maple-Syrup, Peter Pan, Steakhouse, Burning-Tongue, Lazy Leucocyte, Hers, His, Christmas's, and Cocktail Party syndromes.

Medicine is a profession that prizes down-to-earth accuracy, leaving its practitioners with few legitimate outlets for flights of ingenious fancy; clearly, naming new syndromes is one of those outlets.

Stanley M. Aronson, MD

A Narcotics Lexicon

The movement and sale of illegal drugs in this nation has now become a major industry; and for medicine to be indifferent to its products—or its widespread influence—is to ignore tangible forces endangering the health and welfare of many Americans. Over the years, the users of illicit drugs have evolved a language of their own, blending the commercial argot of the underworld with the vivid but impermanent, idiomatic metaphors of the street. The alcoholic world of F. Scott Fitzgerald (with its rotgut, booze and bootlegging) has now been supplanted by a newer netherworld flaunting a vastly greater menu of mood-altering drugs. Many of these drug synonyms, after a time, become inaccurate since their meanings tend to drift. Dictionaries have been assembled (notably, Spears' *The Slang and Jargon of Drugs and Drink*) listing the incredible numbers of alternate slang words for common street drugs.

When drugs of great street value bear widely identified, easily recalled names such as cocaine or demerol or heroin, why would anyone go to the trouble of inventing new names? Certainly not to enrich further the *lingua narcotica* for its own sake. What then does all this new-word production signify? Perhaps the addict clings to the fleeting illusion that by calling it by another name he will distance himself from the robust tentacles of the narcotic. Or perhaps it is merely a plaintive attempt to shrink a clinging gorilla to a pet of manageable size by substituting gentler euphemisms for the realities of addiction. No longer, for some, are these drugs merely expensive habits or recreational pursuits; instead, they have assumed a primal importance far greater than personal health, occupation, family or even religious belief. In these circumstances the avoidance of the accepted name of a drug may be likened to those cultures where euphemisms are employed since the Creator's proper name may never be uttered.

Drug users have chosen various ways of transforming a pharmacological name: By personalizing it; by selecting a diminutive of its conventional name thus is some manner reducing its dimensions; by selecting some modest detail about it such as its color, shape, manufacturer's name (Abbott, Lilly, etc) or even something as trivial as the numeric value of its first letter; by cloaking it in a Spanish metaphor; or by substituting some humorous phrase for it.

Listed below are some illicit agents and a few of their more intriguing street euphemisms. These represent, of course, but a small fraction of common synonyms.

Amphetamines: *blancas*, derdes, speed, jolly beans, zings, *bambita* (Sp., little bomb), *copilotes* (because some truckdrivers use them on long hauls); for ephedrine, freddies.

Heroin: Personalized as Harry or H or Horse; sometimes *caballo* (Spanish for horse); sometimes horse-radish; chocolate; or 8 (H is the eighth letter of the alphabet.).

Cocaine: Charlie, C, coke, Corinne, candy, snow, 3, white lady, sleighride.

Codeine: Codies, cement (possibly because of its constipating effect), hyke (de-

rived from Hycodan).

Barbiturates: Barbies, downers; for nembutal, nebbies, abbots; for amytal, amies, blue angel, *pajaro azul* (Sp., blue bird), *azulillos*; for seconal, *cardenales* (Sp., red bird), *diablo rojas* (Sp., red devil), seccie, red lilies.

LSD: Acid, travel agent, Christmas tree, instant Zen, Swiss purples, California sunshine, Sandozes.

Marijuana: laughing grass, Mezz (named for jazz musician Mezz Mezzrow.)

Morphine: Miss Emma, GOM (God's own medicine), lillies.

Tranquillizers: tranks; for valium, blue bomber (or BB), dies (from diezepam); for quaalude, ludes, California quail, Q's,

Others: Demerol, demmies, meps. Paragoric, goric. Percodan, perks. Phencyclidine, PCP, *elephante*, fairy dust, moon beams, mean greens.

Working class British synonyms, particularly for alcohol, often assume the form of rhyming slang as a substitute for the substance referred to. For example, a reference to Highland whiskey might be expressed as "gay and frisky" and a drug fix might be called a "Tom Mix." And when all else falls to disguise the true name of the drug, there is always pig latin (eg, E-tay for tea, a synonym for marijuana.)

Does it aid the physician to possess some intimacy with drug culture nomenclature? Probably not, unless the physician works in an emergency room to which overdosing victims will generally be brought; a toxicological screen absorbs many hours before yielding answers and some working notion of the nature of the illicit agent therefore might be critical.

To the reasonably stable adult, smoking, sniffing, swallowing or injecting drugs of unknown name or chemical composition doesn't seem smart. But a far greater number of the young are in an experimenting stage, unwisely trying the conventional—or the unconventional—agent for possible mood-altering dividends; and with such individuals, their sole knowledge of the drug may be its street name. The utter tragedy, of course, is that wisdom continues to be narrowly confined to the wise.

The essence of effective medicine, thought Osler, rested in clear, unambiguous communication: the patient understanding the physician's questions and instructions; the physician understanding the patient's message. If all patients were candid, educated and articulate; and if all physicians were infinitely patient and schooled in the jargon of the disenfranchised, all patient-physician dialogs would then become models of communicative clarity. But the world is otherwise and gritty reality forces the practitioner to learn now a narco-land language never taught in medical school.
Stanley M. Aronson, MD

Patenting Medical Thoughts

The threats to our ability to practice medicine are numerous and increase daily. Typically blamed on intrusions by lawyers, governments, and insurance companies, the most recent threat is the result of an unholy alliance between a few doctors and lawyers.

The threat results from the patenting of some medical procedures. We have long accepted the concept that devices, instruments and medications, the "hardware" of medicine can and should be patentable.

The tradition of medicine, however, has been that discoveries such as surgical techniques, intellectual methods of diagnosis, etc. were available freely to all. The "software" of medicine has always been available to any physician sufficiently interested and diligent to learn the newest techniques and intellectual thought processes.

No more!

Some doctors have patented medical thought processes and the actual techniques of surgical procedures. The most blatant example is patent #5,080,111 obtained by Dr Sam Pallin for a specific incision in cataract surgery. Dr Pallin wishes to charge a royalty to any ophthalmologist using this incision and has said that teaching residents to use this incision is an infringement of his patent rights.

Dr John Stephens holds patent #4,986,118 describing how to tell the sex of an unborn fetus by ultrasound.

Hundreds of other patents have been obtained. The motive is easy to discern: money.

A physician patented a method of implanting intraocular lenses then sued the manufacturer stating that they had infringed his rights by teaching physicians how to implant the lenses. He settled for more than $10 million. Who pays that fee? The patient, of course. The cost of the lens must reflect that award. Dr Avaro Latorre has patented a method of injections for male impotence. His company has settled with one drug firm for more than $100,000.

The above facts and more were reported at the meeting of the AMA House of Delegates in June of this past year and described by *American Medical News* (Vol. 37, #33, Sept. 5, 1994). One ophthalmologist is being sued for $6 million for using the proprietary cataract incision. The defense of such a suit can be ruinous. The award, if successful, would be bankrupting. No insurance covers these expenses.

The argument in favor of such patenting states that the right of ownership encourages individuals to devote time, energy and resources toward the development of new ideas. For thousands of years, however, doctors have sought new methods of diagnosis and healing without considering the material rewards that might accrue from selling the "rights" to use the process. The desire to patent medical procedures has never been a necessary or even peripheral motivation. Doctors always have received fame, glory and often money (from performing the procedure or teaching it) as a result of innovative ideas resulting in improved diagnosis and therapy. A form of immortality may be achieved on occasion. Consider McBurney and his "point," Willis and his "circle" and even Rokitansky and his "sinuses" among numerous examples.

The concept of patenting such procedures is contrary to the tradition of the free sharing of information for the benefit of the patient. To allow medical procedures and thought processes to become proprietary would be to negate a tradition rooted in altruism and beneficence dating back to Hippocrates.

There is precedent to declare an action considered ethical in general society unethical in the practice of medicine. The most obvious example is sex. We all would agree that most sexual relationships generally do not raise ethical concerns (though they may raise other concerns). Sexual relationships in the context of the doctor-patient relationship, however, are unequivocally unethical. Likewise the patenting of intellectual processes such as the algorithm and concept of a computer program does not raise ethical concerns but the patenting of the technique of a surgical incision might well raise such concerns.

At the instigation of the New England Delegation, the AMA House of Delegates, meeting in June, "vigorously condemned" these patents and instructed the staff to work with Congress to outlaw them.

The AMA Council on Ethical and Judicial Affairs (CEJA)intends to consider whether such patents are ethical. CEJA opinions concerning ethics are separate from AMA policy decided by the house of delegates and are considered by many courts and legislators as authoritative bases for decisions.

There is nothing good about these patents. At worst, patients will be denied the best and most innovative care. At best, the cost of medical care will be increased with the money channeled to a very few individuals who are ignoring an altruistic tradition of thousands of years.
Herbert Rakatansky, MD

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Premature Ovarian Failure: Treatment Strategies

Carol A. Wheeler, MD

Premature ovarian failure (POF), or menopause before the age of 40, affects 1% to 3% of women and is seen more often in women with primary amenorrhea. Symptoms of estrogen deficiency, although similar to those seen in normally timed menopause, may often be exaggerated and more significant when occurring in the younger patient with secondary amenorrhea. The management of these patients, particularly when fertility is an issue, has long been a challenge for health care providers.

Etiology

Normal ovarian function is dependent on the supply of germ cells present in the ovary. After 11 weeks intrauterine gestation, the female fetus's supply of germ cells increases by the process of mitosis to a maximum of 6 to 7 million oocytes by the 5th month of gestation. By the 7th month of gestation these oocytes are arrested in meiotic prophase. From this point on, there is a rapid decrease in the number of oocytes so that at the time of normal puberty there are approximately 200,000 oocytes present. Only 300 to 400 oocytes are ovulated in a normal reproductive lifespan with the remainder undergoing atresia. Premature ovarian failure occurs when this process of follicular atresia is accelerated so that the supply of oocytes is exhausted earlier.

The reason behind this accelerated atresia is often unknown. Genetic causes are among the most common known etiologies, although the majority of patients have a normal female karyotype. Turner's syndrome (46 XO) is one of the most common chromosomal anomalies leading to ovarian failure, along with mosaicism or structural anomalies of the sex chromosomes. These patients may present with varying degrees of sexual infantilism along with primary or secondary amenorrhea, depending upon the specific genetic defect. Deletion of the short arm of the X chromosome is associated with typical Turner's stigmata while deletion of part of the long arm leads to ovarian failure. About 10% to 18% of patients with POF may have an autoimmune etiology.[1] Various investigators have identified anti-ovarian antibodies in the serum of patients with POF. There also is increased frequency of POF in women with other autoimmune diseases such as thyroid autoimmune disease, rheumatoid arthritis, myasthenia gravis and Addison's disease. Patients with POF may have an increased degree of lymphocytic and plasma cell infiltration seen near the follicles on ovarian biopsy. POF patients may undergo remission when treated with corticosteroids for autoimmune disease.

Mumps oophoritis is the only documented viral cause of POF.[2] Pelvic tuberculosis also has been reported as an etiologic agent.

Treatments with or exposure to high dose radiation may lead to ovarian failure. Cancer chemotherapeutic agents have varying effects on the ovary. Younger women are less likely to experience amenorrhea and ovarian failure with these drugs than patients older than 30. This type of POF is sometimes temporary and reversible.

Metabolic disorders are an uncommon cause of POF. These include galactosemia, mucopolysaccharidoses, myotonic dystrophy and ataxia telangiectasia.

Lastly, "resistant ovary syndrome" occurs when gonadotropins are elevated in the presence of ovarian follicles that fail to respond, possibly due to a receptor or postreceptor defect. Although these patients may be diagnosed definitively by ovarian biopsy, this is not widely recommended since pregnancy is still quite remote and the diagnosis does not change the treatment plan. The presence of follicles does not necessarily determine the response to treatment. Therefore, ovarian biopsy is not justified for routine use in POF.

Diagnosis

Women with premature ovarian failure may present either with primary or secondary amenorrhea. Ovarian function often wanes gradually and the patient may present with irregular menses and hot flashes. Ovarian failure may be intermittent in approximately 10% of these women and some authors have suggested that it may in fact only be a temporary condition in a select group of patients. Generally, when these women are given a progestin challenge test they will fail to experience a withdrawal bleed. When given *both* an estrogen and a progestin, they have a normal endometrial response with a typical withdrawal bleed.

In patients with suspected POF, a complete history and physical examination should be done, looking specifically for stigmata of Turner's syndrome and secondary sex characteristics. Hot flushes and vaginal discomfort occur in approximately 50% of women with premature ovarian failure. Thirty per cent of these women, particularly those with primary amenorrhea, may have abnormal or incomplete breast development. Many of these patients present with infertility with only 34% having conceived before the diagnosis of POF. In fact, recognition of these patients seems to be increasing with the frequent addition of serum FSH levels to the infertility evaluation.

Laboratory studies (Table 1) reveal a normal prolactin level and thyroid function tests. The serum follicle stimulating hormone level (FSH) is generally quite elevated, greater than 20-40mIU/ml, depending on the assay. Since the FSH level varies greatly due to its pulsatile and variable nature, it is recommended that the FSH be repeated on several occasions to confirm the diagnosis. Once the diagnosis of premature ovarian failure has been made, a search for its etiology involves a number of routine laboratory studies. A karyotype should be obtained to rule out the presence of a Y chromosome that would indicate the need for gonadectomy. Other laboratory tests should include: calcium, phosphorus, serum protein, CBC, sedimentation rate, thyroid function and anti-thyroid antibodies, serum glucose and serum cortisol. Some authors also recommend anti-adrenal and anti-ovarian antibodies although their clinical significance is controversial and may not impact on treatment. Lastly, a baseline ACTH stimulation test to evaluate the adrenal gland may be indicated.

Treatment

The treatment of a patient with POF who does not desire pregnancy focuses on the risks associated with long term estrogen deficiency. Along with hot flashes and urogenital atrophy symptoms, osteoporosis and premature cardiovascular disease are seri-

Premature ovarian failure occurs when . . . follicular atresia is accelerated so that the supply of oocytes is exhausted earlier.

ABBREVIATIONS USED

ACTH: Adrenocorticotrophic hormone
FSH: Follicle stimulating hormone
GnRH: Gonadotropin releasing hormone
IVF: In vitro fertilization
LH: Luteinizing hormone
POF: Premature ovarian failure
TSH: Thyroid stimulating hormone

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ous consequences of the loss of ovarian function, particularly for the young patient. Fortunately, these problems are preventable with treatment with hormone replacement therapy. If the patient prefers, she may use a combination oral contraceptive agent, with the advantage that she will also have adequate contraception should she have a spontaneous ovulation. The other option is standard menopausal replacement regimens such as intermittent progestin (daily estrogen with progestin the first 12 to 14 days of the month) or continuous combined treatment (daily estrogen and progestin). The necessary estrogen dose may be as high as 1.25 mg of conjugated estrogens or its equivalent to provide symptom relief in this young patient group.

The treatment of a patient who hopes to conceive is much more complex. Patients with evidence of autoimmune disease may benefit from treatment with corticosteroids or plasmapheresis.[3] This may help to reduce the level of circulating autoantibodies.

Some patients with POF may have spontaneous ovulation and subsequent pregnancy. This is due to the presence of a few remaining follicles that ovulate under the influence of the high levels of endogenous gonadotropins. This may lead to the erroneous impression of a treatment success instead of simply a manifestation of the intermittent nature of the process. Patients on estrogen replacement who fail to have a withdrawal bleed should be evaluated for the possibility of pregnancy.

Some investigators have treated women with POF with low doses of estrogen in an attempt to induce an ovulation. Endogenous LH and FSH levels are decreased by exogenous estrogen treatment and the rebound of gonadotropins may lead to follicular development. In addition, the estrogen may lead to an increase in both FSH and LH receptors in the follicle. This treatment has met with minimal and inconsistent success.

Clomiphene citrate and exogenous gonadotropin therapy in high doses have been tried in these patients with limited success. It is possible that these medications contributed little and that the reported successes were due to the somewhat intermittent nature of the disease process in certain women. An alternative is treatment with a GnRH agonist followed by gonadotropin treatment. This has resulted in ovulation on occasion but no pregnancies in several studies.[4,5]

The most promising treatment for POF involves the use of donor oocytes. This treatment has evolved from 1987 when it was first introduced.[6] Initially, *in vivo* fertilized embryos were obtained by uterine lavage of an oocyte donor who had been inseminated with the sperm of the recipient's husband. With the improvement in assisted reproductive technologies such as in vitro fertilization (IVF), the technique now involves oocyte aspiration from a donor, IVF, and embryo transfer to a recipient patient.

Table 1—Evaluation of the patient with premature ovarian failure

History and Physical Examination
Serum prolactin
Serum FSH (should be repeated at least weekly for one month)
Karyotype
Calcium phosphorus
Total serum protein
CBC with differential
Sedimentation rate
TSH, free T4, antithyroid antibodies
AM cortisol, possibly ACTH stimulation

Fertile donors undergo a standard regimen of ovarian hyperstimulation with gonadotropins. A recipient woman is simultaneously treated with exogenous estrogen and progesterone to synchronize her endometrium. Some oocyte recipients (who may still have functioning ovaries) are pretreated with a GnRH agonist before exogenous steroids. Oocytes are retrieved from the donor and placed in culture, where they are inseminated with the recipient's husband's sperm. They are then transferred to the recipient woman's uterus.

Oocyte donation is associated with minimal risk to the recipient other than those of a normal pregnancy. If pregnancy occurs, hormone replacement is generally continued for up to 14 weeks of pregnancy to ensure adequate placental production. The risk for the oocyte donor is low, although she may experience ovarian hyperstimulation, ovarian trauma and infection. There is also the theoretical risk of an increased incidence of ovarian cancer in women exposed to exogenous gonadotropins. The magnitude of this potential risk is unknown.

The source of oocyte donors is variable. Some women have friends or sisters who serve as altruistic unpaid donors. Other patients undergoing IVF who have excess eggs provide another source, although, with the use of embryo cryopreservation this is a limited source. Most programs use paid anonymous donors, who receive compensation for their time and involvement. Careful donor selection by the program is critical with screening involving both medical and psychological evaluations. Donor age is generally between 18 and 35 years and proven fertility is desirable.

Pregnancy rates using donor oocytes exceed that for standard IVF. The 1992 Society for Assisted Reproductive Technology Registry report indicated a success rate of 31.3% deliveries per retrieval nationwide in the US for donor egg cycles.[7] This is in contrast to the overall IVF pregnancy rate of 16.8% deliveries per retrieval. The higher success rate in oocyte donation cycles has been attributed to the fact that these programs use healthy eggs from young fertile women placed into an optimally prepared uterus. This is a rapidly expanding service, with 1992 statistics showing 137 programs performing 1802 cycles.

The ethical issues surrounding the use of donor oocytes are complex. Concerns about possible risks to the donor are paramount and require careful counseling and informed consent. Although patients with premature ovarian failure are under 40 years, these techniques have been used for women as old as their 60s. The health of the mother and issues related to older parents are particularly difficult to address. The problem of coercion, particularly when the donor is a friend or sister, is a significant concern. Although this is a very effective treatment it must be undertaken with care and counseling of all involved parties.

Summary

Premature ovarian failure is a relatively common condition whose diagnosis, despite several known etiologies, most often results from an unknown cause. Treatment options for the women not desirous of pregnancy are straightforward and consist of hormone replacement therapy. For the patient who hopes to attain a pregnancy, treatment is much more complex and has, in the past not held much promise. However, with the advent of the use of donor oocytes, an extremely effective option is available.

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The Hot Flash: Pathophysiology and Treatment

Gary N. Frishman, MD

The constellation of changes associated with the hot flash are consistent with a disorder of temperature regulation.

Occurring in up to 85% of menopausal women, the hot flash is the most characteristic symptom of menopause and remains the most common somatic complaint of women presenting to a health care provider for treatment of menopausal symptoms. As the baby boomer population reaches menopause, the percentage and number of women seeking help for this symptom likely will significantly increase.

Although hot *flush* and hot *flash* are often used interchangeably, some believe that a hot flush describes the blushing and sensation of heat whereas hot flash includes the associated sweating.[1] For this review, hot "flash" will be used exclusively.

Characteristics of the Hot Flash

Most women describe the hot flash as a sudden sensation of heat felt to radiate from the skin over the face, neck, and chest. This is followed occasionally by a chill and usually is associated with sweating or perspiration. The flash may also be accompanied by a reddening of the skin. The patient may experience a sensation or prodrome 0.5 to 2 minutes prior to the onset of visible symptoms. These sensations may include anxiety, tingling, or pressure in one's head. The main sensation of the hot flash is that of intense heat which, while typically lasting for several minutes, may be completed in seconds or occasionally last as long as an hour. Approximately 13% to 14% of hot flashes are perceived as severe.[2] This may be related to the length or duration of the hot flash with a longer hot flash being perceived as more intense.

Marital status and parity have not been able to be identified as predictors of a woman's predisposition to having a hot flash. However, some investigators have reported that socioeconomic factors (level of education, etc.) as well as factors related to the decline of estrogen production before the complete cessation of menses were linked to the occurrence of hot flashes.[3]

There has been an increasing recognition of the role of stress as a precipitating factor for hot flashes. Some investigators have found a possibly causal relationship[4] while other researchers have concluded that increases in the frequency or intensity of hot flashes correlate with increasing levels of stress. In these studies, objective findings and measurements correlated with the patient's perception of the hot flash.[5] Consistent with this, some women describe personal triggers or thresholds that induce the onset of their hot flash.

The number of hot flashes tends to decrease with time. However, some women experience flashes more than 5 years after they start.[2] Hot flashes tend to occur evenly throughout the day and night. However, many patients find the awakening at night caused by a hot flash to be particularly troublesome. Night-time hot flashes may be related to other symptoms of the menopause. With a nocturnal hot flash, the amount of time spent in REM sleep can be reduced leading to a significant impairment of a woman's overall function. These symptoms may include depression with its associated insomnia, lack of energy, appetite changes, memory changes, and lack of interest in normal activities. There are many anecdotal cases of women unsuccessfully treated for these changes with antidepressants.

Although estrogen relieves most, if not all, of the symptoms attributable to sleep disturbances, it is important that this tentative diagnosis does not obviate a search for a depression unrelated to the hypoestrogenic state in these women. Occasionally treatment with both an estrogen and an antidepressant is appropriate. Making the diagnosis more difficult, hot flashes may also be similar to (or even precipitate) a panic attack necessitating a careful search for the etiology of the problem.

Pathophysiology

The difficulties in studying hot flashes reflect disparities in the absolute presence, number, quality, and duration of hot flashes experienced by different women. The significant placebo effect noted in most studies evaluating treatment regimens for hot flashes further complicates one's ability to draw meaningful conclusions.

The constellation of changes associated with the hot flash are consistent with a disorder of temperature regulation. Control of the body's temperature has been localized to the rostral hypothalamus which controls the body's set point. The neurons in this region are temperature dependent and work to maintain a set core temperature. Changes in the core temperature (usually induced by changes in external environment) affect the firing of these neurons and result in the sequence of events designed to adjust the body's temperature accordingly.[6]

With a decrease in the set point of the thermoregulatory center, sweating and vasodilation occur as a mechanism to decrease the body's temperature. The sweating and vasodilation, accompanied by changes in the heart rate, result in an increase in skin temperature. The increase in finger temperature is about 7.5° F while the pulse typically increases approximately nine beats per minute (although it may be twice that). The increase in blood flow to the skin lasts beyond the subjective duration of the hot flash with the skin temperature taking 30 minutes to return to normal.[7]

The withdrawal (rather than the lack) of estrogen precipitates a hot flash by some mechanism parallel to the associated rise in pituitary gonadotropins. The role of estrogen withdrawal in inducing a hot flash requires a previous priming of the system with a previous exposure to estrogen. As such, women with normally low endogenous levels of estrogen (prepubescent women, etc.) do not experience hot flashes. However, hot flashes can be induced in patients with normally low estrogen levels (eg, men, women with gonadal dysgenesis, etc.) by the administration and subsequent withdrawal of estrogen. An abrupt cessation or withdrawal of estrogen, such as that incurring with a surgical (rather than a natural menopause), is associated with a higher incidence of hot flashes.

Attention has focused on luteinizing hormone (LH) since elevations of follicle stimulating hormone (FSH) do not seem to correlate consistently with the onset of a hot flash. Multiple blood sampling in women

ABBREVIATIONS USED:
FSH: Follicle stimulating hormone
GnRH: Gonadotropin releasing hormone
LH: Luteinizing hormone
REM: Rapid eyeball movement

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experiencing hot flashes has documented that the subjective onset of the flush corresponds to the LH pulses and with a surge in the hypothalamic release of gonadotropin releasing hormone (GnRH). Most believe that some process associated with, or parallel to, the release of GnRH and the subsequent rise of LH precipitates the hot flash.

These views are consistent with the clinical observation that women with hypogonadotropic hypogonadism (anorexia nervosa, competitive athletes, etc.) who do not release GnRH (and subsequently LH) do not experience hot flashes even though they are hypoestrogenic. Since administration of gonadotropin releasing hormone does not induce a hot flash, even though it elevates the levels of LH, GnRH is not felt to be the causative agent. Although every hot flash occurs simultaneously with the onset of a pulse of luteinizing hormone, there are many pulses of luteinizing hormone which are not followed by a hot flash. Further confusing the issue, the release of LH is neither critical for neither nor obligatory for a hot flash. It has been shown that changes consistent with a classic hot flash can occur in women after hypophysectomy who do not have the ability to release luteinizing hormone.[8]

Investigators have attempted to delineate the mechanism which acts parallel to the release in GnRH. A decline in estrogen has been shown to lead to a decrease in catecholestrogens resulting in an increase in norepinephrine. This is felt to lead to an increase in GnRH with an associated downward setting of the central thermostat and a hot flash.[9] Some have speculated that opioids and norepinephrine are linked to the onset of a hot flash[7] and beta-endorphins have been found to fall significantly with the beginning of a flash.[10]

Although a decrease in estrogen levels is felt to be critical for the initiation of a hot flash, no absolute threshold level of serum estrogen has been established and a hot flash may occur whenever the relative level of estrogen is lowered. As such, women can experience hot flashes at times other than menopause when they undergo fluctuations in their hormonal environment. These include night sweats at puberty and hot flash-like symptoms during pregnancy and soon after delivery as well as during various phases of the menstrual cycle.[11] Similarly, men can experience hot flashes after undergoing orchiectomy. In one report, approximately 76% of men having undergone bilateral orchiectomy experienced hot flashes with 30% feeling that their symptoms warranted treatment.[12] Although women with greater endogenous estrogen levels (ie, higher mean body weight) tend to experience fewer hot flashes, perimenopausal women that appear to have adequate estrogen levels may still have hot flashes. This variable estrogen threshold may be related to differences in vascular response.[1] Alternatively, the inability to determine a specific estrogen threshold may relate to the inability to assess estradiol levels at the level of the hypothalamic portal system. The peripheral serum estradiol measured may not reflect the hypothalamic levels that may ultimately determine whether a hot flash is induced.

Fortunately, objective parameters such as changes in finger temperature, skin conductance, and core temperature can been used to follow hot flashes. Of these, changes in skin conductance are the most sensitive and specific indicator of hot flashes.[13] These tools allow some objective assessment of flash frequency and duration as well as treatment efficacy.

Kronenberg summarized the various hypotheses of the derangements associated with hot flashes: "1) development of hyperthermia in the presence of a normal central thermoregulatory system, resulting in the activation of heat loss responses by the thermoregulatory system to return the internal body temperature to normal; 2) direct activation of continuous blood vessels and sweat glands in the presence of normal body temperature and unaltered central thermoregulatory system, resulting in lowered core body core temperature and secondary activation of thermoregulatory effector mechanisms (vasoconstriction and shivering) to return core temperature to normal; 3) a transient lowering of the thermoregulatory set point, resulting in autonomic (vasodilation and sweating) and behavioral responses that facilitate heat loss and cause a fall in core temperature. A rapid return to the normal set point leads to the activation of heat conservation (vasoconstriction) and heat production (shivering) mechanisms to return core temperature to normal."[11]

Differential Diagnosis

Most hot flashes in the menopause are related to estrogen deprivation. The most common (of the uncommon) non-estrogenic related causes of hot flashes is alcohol. Women with a deficiency or low level of activity of alcohol dehydrogenase may be particularly prone to flushing with alcohol intake. Pathologic conditions, such as release of endogenous pyrogens associated with bacterial infection, can raise the hypothalamic set point and inappropriately cause the neurons to fire producing fever.[6] Malaria and other infections that cause night sweats can be misinterpreted as a typical hot flash. Extremely rare causes of hot flashes include carcinoid syndrome or pheochromocytoma. As noted earlier, panic attacks and other psychiatric symptoms may be similar to, and confused with, a hot flash.

Treatment

Estrogen remains the mainstay for treatment of hot flashes. Whether given orally, transdermally, or via an implant, estrogen will reliably and reproducibly treat hot flashes in the majority of women. Because of the inconsistent systemic levels achieved with vaginal creams, these cannot be recommended to treat hot flashes. Typically efficacious doses of oral estrogens include conjugated equine estrogen 0.625 mg/day, 17 beta-estradiol 1 mg/day, and transdermal 17-beta-estradiol 0.05mg/day. Although all of these medications are equally effective, many physicians have the most experience with conjugated equine estrogens. If treatment is ineffective at the dose of 0.625 or 1.25 mg of conjugated equine estrogens, consideration should be given to using one of the 17-beta-estradiol formulations to allow a more direct monitoring of serum estradiol levels. If serum estradiol levels are low (<35 pg/ml), absorption or compliance problems should be considered. In general, while on a form of estrogen other than a pure 17 beta-estradiol formulation, if serum estradiol and estrone levels are greater than 40 pg/mL and 100 pg/mL, respectively and hot flashes persist, non-hypoestrogenic etiologies for the patient's symptoms should be considered. Alternatively, a practitioner can evaluate the vaginal mucosa and perform a vaginal smear to assess systemic absorption. It is important to counsel your patient that the full therapeutic effect of the estrogen may not be seen for up to 6 weeks.

The occurrence of hot flashes will often subside with time, thus minimizing the need for long term hormone replacement therapy. However, there are a multitude of other reasons to consider extended, if not lifelong, treatment regimens. The risk of heart disease, the number one killer of women in the United States, may be reduced by 50% in menopausal women by the use of estrogen. Estrogen therapy is also a cornerstone for the treatment of osteoporosis.

Alternative Treatment Regimens

Progestational agents are the medication of choice when an estrogen is unable to be tolerated or carries a relative or absolute contraindication (such as with a history of breast cancer). Like estrogen, the route of the progesterone does not appear to be critical. Depo-medroxyprogesterone acetate in a dose typical of that used for contraception or high dose oral medroxyprogesterone acetate (20 to 40 mg per day) is effective. Interestingly, the addition of cyclical progestin to conjugated equine estrogens has not

been found to further increase the efficacy of this treatment, despite having a synergistic effect on the lower of gonadotropins.[14] Although a potentially beneficial affect on bone may be seen, the possible adverse affects on lipids make long term treatment with synthetic progestational agents unattractive. Treatment options include natural micronized progesterone or short term courses of the more common synthetic progestins to get over the brunt of hot flashes.

Clonidine at a dose of 0.1–0.2 mg B.I.D. has shown some varied success in the literature. Methyldopa in a dose of 250 mg 2-3 times a day has also been reported to be efficacious.[15] Mixed reports exist for the use of Naproxen, beta-blockers, Veralipride, and Naloxone.[15]

A double blind randomized cross-over study evaluated transdermal quinidine (equivalent to a daily oral dose of 0.1mg) for 4 weeks compared to a placebo in a population of men who had undergone either a surgical or medical orchiectomy for prostate cancer and subsequently complained of hot flashes. As with many proposed treatment regimens, no significant difference was found between the active agent and placebo.[12]

Various forms of biofeedback have been used successfully by some practitioners to reduce the number of hot flashes in women who are unable or unwilling to undergo trials of medication. These techniques do not enjoy widespread acceptance.

Summary

Hot flashes are the most frequent somatic complaint of women going through the menopause. Although the exact pathophysiology of the hot flash remains unknown, it appears to be related to an alteration in the set point of the hypothalamic thermoregulatory center. With the withdrawal of estrogen, some event parallel to the release of GnRH (and subsequent release of LH) causes a decrease in the set point of the thermoregulatory center. The hot flash, with its characteristic sweating and vasodilation, represents the attempt to decrease the body core temperature and restore equilibrium. Estrogen therapy reliably treats hot flashes in the majority of women in addition to its proven beneficial effect on heart disease and osteoporosis. It is rare that health care providers can so reliably and safely positively impact on a patient's symptoms and overall health.

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Cystocoele: Diagnosis and Management

Deborah L. Myers, MD

Management of a cystocoele depends on the degree of cystocoele noted, the number of complaints related to the cystocoele, the general health and medical condition of the patient, and the patient's desire for treatment.

Cystocoele, loss of support of the bladder on the anterior vaginal wall, is a common female hernia. Other types of pelvic relaxation in women are rectocoele, uterine, uterovaginal or vaginal vault prolapse. The incidence of pelvic relaxation ranges from 0.6% to 12%, depending on race. Pelvic relaxation is reported low in the Bantu, black and Chinese women (0.6 to 6.5%) and much higher in white, Japanese and Indian women. Many factors have been investigated to account for these differences such as pelvimetry, rates of childbirth, unattended childbirth, connective tissue make up, and the position of squatting for defecation. Other factors that contribute to pelvic relaxation are the decline of estrogen during menopause, occupations that require heavy lifting and chronically increased intra-abdominal pressure from respiratory diseases, ascites, or chronic constipation.[1]

Signs and Symptoms

A woman with a cystocoele may be asymptomatic if the degree of relaxation of the anterior vaginal wall is mild and the progression of the cystocoele has been slow. A woman who develops a cystocoele rapidly will tend to have more complaints: pelvic pressure especially after standing for long periods of time, low back ache by the end of the day, a sense of "something falling out," or she may notice, in fact, a "bulge" like "an egg" in the vagina. The woman may also experience changes in her bladder function, ie, urgency, frequency, urinary incontinence, or an inability to empty the bladder.

In the dorsal lithotomy position, the anterior wall of the vagina can be examined by using the posterior blade of a vaginal speculum. With the single blade in the place, the anterior wall of the vagina is observed while the woman is asked to strain (Valsalva) or cough. The degree of descensus of the anterior vaginal wall is noted. Descensus is graded either as mild (halfway to the introitus), moderate (to the introitus) or severe (beyond the introitus). Also, while the patient is in the dorsal lithotomy position, it is important to evaluate the cystocoele using either a ring forceps or Baden elevator (Figure 1) to determine which type of cystocoele is present so that one may direct appropriate therapy. It is also important to examine the patient in the standing position to demonstrate the full extent of the prolapse and also to evaluate for the presence of indolent vaginal vault detachment.

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Urethra and Bladder Supports

The bladder and urethra are supported by the anterior vaginal wall and, if a uterus is present, by the lower segment of the uterus. The vagina in turn is supported by the endopelvic attachments to the lateral sidewalls of the pelvis at the arcus tendineus fascia (see Figure 2). The main supports of the uterus are the uterosacral/cardinal ligament complexes. These ligaments are not true ligaments such as we know in musculoskeletal joints, but condensations of endopelvic fascia. The endopelvic fascia between the bladder and vagina is termed the pubocervical fascia and is responsible for attachments of the bladder base.

The specific supports of the urethra have been long investigated. It has been thought that "pubourethral ligaments" that attach the urethra to the pubic symphysis are the suspensory apparatus of the proximal urethra. Further investigation by DeLancey has revealed that such "ligaments" do not exist, and that the retropubic position of the proximal urethra is *dynamic*.[2] The proximal urethra is supported by periurethral fascial attachments to the fascial arcus and by pubovesical striated muscle. These dynamic attachments allow the proximal bladder neck to funnel during voiding. However, the distal urethra is maintained in a *fixed* position by the perineal membrane (also known as the urogenital diaphragm). The pubocervical fascia of the bladder base is trapezoid in shape (Figure 3) and defects in this facial base can occur laterally, centrally, distally or transversely.

Types of Cystocoele

Although any relaxation of the anterior vaginal wall may be categorized as a cystocoele, it is crucial for management and proper therapy that the specific cystocoele be identified. Depending upon the location of the defect in the pubocervical fascia, several types of cystocoele can exist.

Central defect—Most gynecologists are familiar with this type of cystocoele. A break in the midline of the pubocervical fascia occurs, usually due to over-stretching of the anterior vaginal wall during childbirth. The injury occurs behind, or posterior, to the interureteric ridge and is thus referred to as a posterior cystocoele.[3] Often there is a lack of vaginal rugae over the cystocoele, and the lateral sulci of the anterior vaginal wall are maintained. A central defect can be diagnosed by observing the persistence of the cystocoele despite elevating the lateral sulci of the vagina with a ring forceps or Baden vaginal elevator.

Paravaginal defect—A less well-known type of defect in the pubocervical fascia is a paravaginal defect. First described in 1909,[4] the break in fascia occurs at the lateral sulci of the anterior vaginal wall. The break may be unilateral or bilateral. The unilateral break occurs more commonly on the patent's right side. The break in fascia occurs where the lateral side of the vagina attaches to the

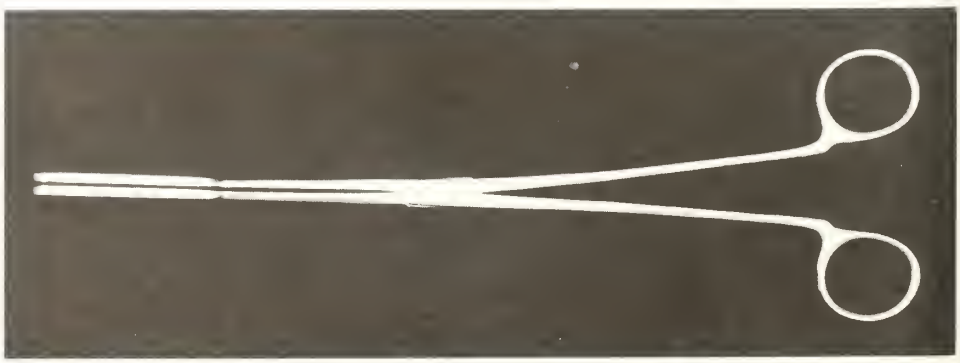

Fig 1.—Baden elevator.

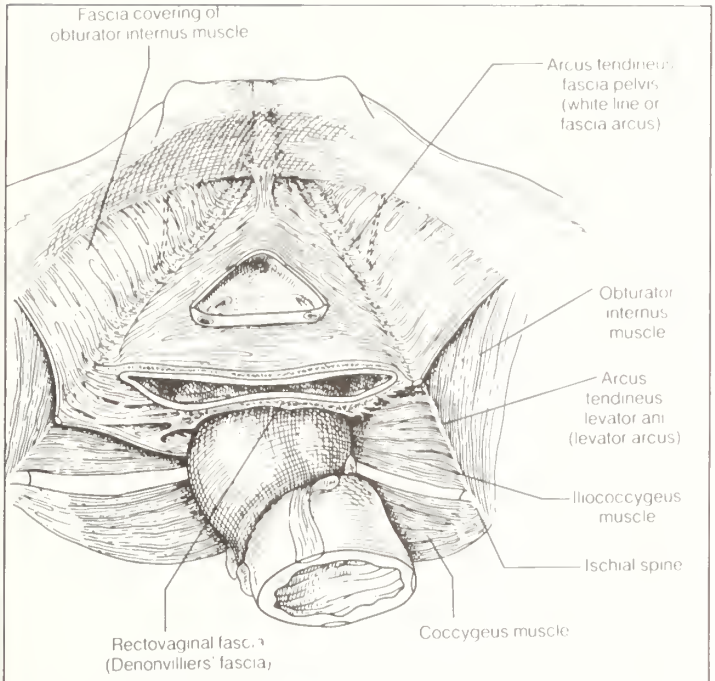
Fascia covering of obturator internus muscle
Arcus tendineus fascia pelvis (white line or fascia arcus)
Obturator internus muscle
Arcus tendineus levator ani (levator arcus)
Iliococcygeus muscle
Ischial spine
Coccygeus muscle
Rectovaginal fascia (Denonvilliers' fascia)

Fig 2.—Endopelvic fascia of the pelvic sidewall. (From Richardson AC. How to correct paravaginally. *Contemporary Ob/Gyn*, Medical Economics Publications 35(9), 1990, with permission.)

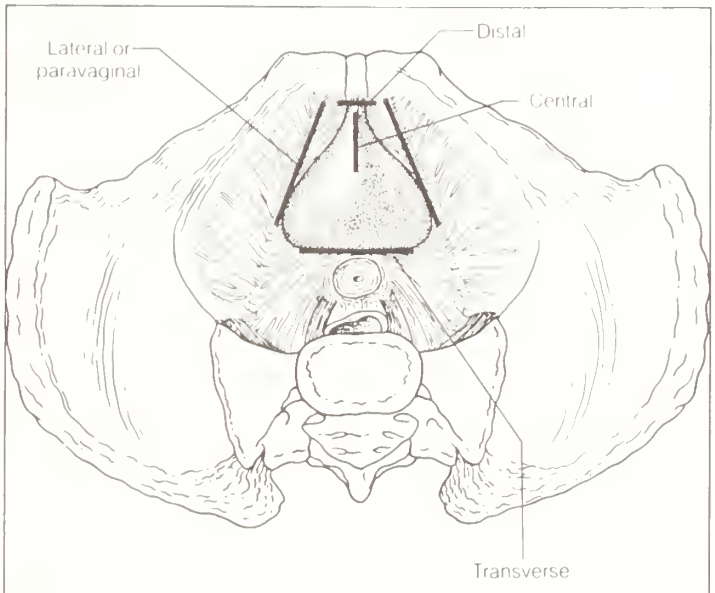

Fig 3.—Potential defects of the pubocervical fascia. (From Richardson AC. How to correct paravaginally. *Contemporary Ob/Gyn*, Medical Economics Publications 35(9), 1990, with permission.)

fascial arcus tendineus (white line) of the pelvic sidewall. To detect a paravaginal defect, the examiner simply uses either a ring forceps or Baden elevator to support the lateral sulci of the anterior vaginal wall and demonstrates that the cystocoele resolves.

Periurethral defect—When breaks or attenuation of the periurethral attachments occur, a pseudocystocoele is present. A true cystocoele does not exist, since there is no relaxation of the anterior vaginal wall upon Valsalva strain. There is, however, rotational descent of the urethra and often symptoms of stress urinary incontinence. This type of injury usually is obstetrical in nature and more common in women with wide pubic arches.[3]

Transverse defect—A transverse defect of the pubocervical fascia occurs when the attachment at the level of the pericervical ring and uterosacral/cardinal ligament complex breaks.[5] The apex of the anterior vaginal wall is detatched. When the apex of the anterior wall is re-elevated the cystocoele will resolve. Therefore, this type of cystocoele also can be described as a displacement cystocoele.[3] Usually the rugal folds of the anterior vaginal wall are preserved and urinary incontinence is not present. However, they are more likely to have large post void residual urine volumes.

Distal defect—A distal defect of the pubocervical fascia is uncommon. When it does occur a true urethrocoele, a prolapse solely of the urethra, exists. The cause of distal defects is usually iatrogenic. For example, this defect is created when, during radical vulvectomy, the distal urethra is severed from the perineal membrane.[5]

Combination of defects—More than one type of defect of anterior vaginal wall support may exist simultaneously. It is important to identify all defects so that proper therapy can be instituted, especially when the therapy is surgical.

Management and Treatment

Management of a cystocoele depends on the degree of cystocoele, the number of complaints due to the cystocoele, the general health and medical condition of the patient, and the patient's desire for treatment.

Special situations—For the patient with an asymptomatic cystocoele, a period of watchful waiting is in order. If the woman is unaware of her condition, education and close follow-up may be provided. The patient benefits from seeing the same physician year after year. The physician is able to examine her and make careful notes in the medical chart that record changes in the progression of the cystocoele, so timely intervention may be offered as indicated.

The patient who has a recurrent cystocoele is one who requires especially close and careful examination. It is crucial for the examiner to obtain previous office and operative reports to ascertain the type and degree of cystocoele and to determine the type of surgical repair, if one was performed. The examiner needs to evaluate the operative report to ascertain the type of technique and suture used, and to determine the reason for failure. In a patient with a recurrent cystocoele the examiner must search for paravaginal defects and detachment of the apex of the vaginal vault.

Conservative therapy—For a patient who does not desire surgical intervention for her cystocoele, conservative therapy can be effective. Additionally, women with severe medical problems who are unable to have surgery are excellent candidates for treatment with pessaries. Ring pessaries, with and without support, are probably the most comfortable for women. The ring of the pessary sits between the posterior cul de sac of the vagina and the pubic bone. The shape of this pessary enables women to remove, clean and reinsert the device on their own. Other types of pessaries useful for supporting a cystocoele are the Smith-Hodge, Gelhorn, Gehrung and donut. These pessaries, however, usually require a health care worker to remove, clean and reinsert the pessary for the patient. With any pessary used, the patient needs to be instructed about potential problems, such as vaginal infections, bleeding from erosion or impaction, difficulty urinating or defecating, and severe pain. The patient must also use either a intra-vaginal hormonal or anti-bacterial cream on a weekly basis to protect the vaginal walls.

Hormone replacement is another component of conservative therapy for a cystocoele. Hormone replacement consisting of estrogen with or without progesterone will help maintain the blood supply, elasticity, and integrity of the vaginal tissues. Hormone replacement will also help improve other symptoms associated with cystocoele such as urgency, frequency, dysuria, incontinence, and urinary tract infections. Oral hormone replacement with supplemental vaginal estrogen cream is optimal, but if a woman is not

a candidate or if she is reluctant, vaginal estrogen cream alone is a suitable alternative. A recent study by Handa et al evaluated the effects of low dose (0.3 mg 3 times per week for 6 weeks) vaginal conjugated estrogen cream and demonstrated little risk of endometrial proliferation.[6]

Pelvic muscle exercises, commonly referred to as Kegel exercises, are also helpful in treating cystocoeles. Pelvic muscle exercises performed correctly strengthen the levator ani muscle group upon which the pelvic organs rest. It is true that pelvic muscle exercises will not re-support a "dropped bladder" but they can strengthen the levator plate such that further descensus can be impeded. Kegel exercises require time and a commitment on both the part of the patient and health care worker. It is important that the patient be shown the proper way to perform pelvic muscle exercises and that she be instructed on how to evaluate herself. Patients often incorrectly squeeze accessory muscles, such as the abdominal or gluteal muscles, and therefore often require a separate office visit to learn Kegel exercises correctly. Phone follow-up from the health care provider is often helpful. Patients are given instructions regarding daily performance of these exercises. For example, four "sets" of 10 repetitions of pelvic muscle exercises is a reasonable recommendation. Other devices available to patients to assist performing Kegel exercises are weighted vaginal cones, perineometers, and vaginal electrical stimulation.

Surgical Therapy

A detailed description of the various surgical repairs for cystocoeles will not be given here. What will be described are the basic principles of each type of repair and the rationale for their approach.

Central defects—The standard vaginal "anterior repair" performed by gynecologists is the best approach for repairing a midline defect of the pubocervical fascia. The anterior vaginal wall is opened and the vesico-vaginal space is entered. The full thickness of the vaginal wall is mobilized exposing the fibromuscular layer and endopelvic fascia out laterally to the pubic rami. One common error performed during this type of repair is splitting the vaginal epithelium from the fibromuscular layer, thus never entering the vesico-vaginal space, and thus never repairing the fascial defect. With the fibromuscular layer exposed, the defect in the midline can be repaired using a delayed absorbable suture.[3] The use of quickly absorbed sutures such as catgut has no place in any type of hernia repair surgery where scar formation is the key element in maintaining the long term success of the repair. The excess vaginal skin can then be trimmed and reapproximated in the midline. It is important for the surgeon to repair the entire length of the anterior vaginal wall, as well as any bladder neck funneling. Bladder neck funneling is reduced by placing a horizontal mattress suture (Kelly) under the urethro-vesical junction.

Variations on this basic technique may be employed. For example, it may be necessary to reduce a large cystocoele first with a purse string stitch or to add artificial support. If the endopelvic fascia and vaginal walls are extremely thin, the use of a polyester or Dacron® mesh may be employed. When a mesh is used it is important to insulate it from eroding into the vagina by using either a bulbocavernosus fat pad or by overlapping the vaginal skin, thus forming two layers during closure.[3]

Paravaginal defects—The technique of repairing a paravaginal defect of the pubocervical fascia, whether it be unilateral or bilateral, can be accomplished vaginally or abdominally. In either approach, the goal is to reattach the lateral sulcus of the vagina to its ipsilateral fascia arcus tendineus. If performed vaginally, the anterior vaginal wall can be opened either in the midline or near the sulci bilaterally. When the repair is performed abdominally, dissection in the retropubic space is carried down to the level of the fascia arcus tendineus. The surgeon then uses one hand to elevate and locate the lateral sulcus of the vagina. The lateral apex of the vagina is then attached to the "white line" at the ischial spine. Subsequent sutures are placed along the remainder of the "white line" towards the pubic symphysis. Whether the repair is done vaginally or abdominally, most operators use a permanent 2-0 or 3-0 suture.

Periurethral defects—When the periurethral attachments that support the proximal urethra have failed, hypermobility of the bladder neck occurs. Hypermobility of the bladder neck often, but not always, is associated with stress urinary incontinence. Before a surgeon proceeds with the repair of urethral hypermobility in a patient who complains of stress urinary incontinence, an adequate pre-operative urodynamic evaluation must be performed. Merely accepting the patient's complaint of stress incontinence as proof of the condition will lead to an incorrect diagnosis about 60% of the time.[7] Other causes of urinary incontinence such as urge incontinence, overflow incontinence, intrinsic sphincter deficiency or urethral diverticulum need to be considered prior to assuming that the patient's urethral hypermobility is the cause of her stress urinary incontinence. Once genuine stress incontinence is diagnosed, the surgeon can counsel the patient about the most appropriate surgical repair. A detailed discussion of all the surgical procedures for genuine stress incontinence is beyond the scope of this article. Two vaginal procedures that re-support the periurethral attachments will be described.

Kelly, in 1913, and Kennedy, in 1937, described plication of the endopelvic fascia surrounding the urethro-vesical junction during the performance of an anterior repair. Kelly recommended a simple horizontal mattress stitch of silk or linen, whereas Kennedy described placing two silver wire sutures more laterally and removing them 5 days later.[8,9] Based upon these early principles, Nichols and Beck have described two other techniques. Nichols recommends using the "pubourethral ligaments" which are the fascial attachments of the proximal urethra to the fascia arcus. A delayed absorbable suture (such as a polyglycolic acid) or permanent suture is used to re-support the bladder neck.[3] Beck's technique involves suturing the endopelvic fascia of the bladder neck to the undersurface of the pubic symphysis. Beck reports his success rates for treatment of stress incontinence as 93%.[10] In the patient who has urethral hypermobility without stress incontinence a Kelly-Kennedy stitch using modern delayed absorbable suture can be employed.

Transverse defects—A transverse defect of the pubocervical fascia that happens at the level of the uterosacral/cardinal ligament complex can be repaired at the time of an anterior repair by reattaching the fascia horizontally. If a vaginal hysterectomy is being done concurrently, then the fascia will be reattached at the time the uterosacral ligaments are reattached to the anterior vaginal wall. If it is determined that the uterosacral ligaments are of poor quality, then re-supporting the apex of the vagina must be accomplished by another means. Two operations that address this problem are vaginal sacrospinous ligament fixation and abdominal sacrocolpopexy.

Distal defects—For the patient in whom the attachment of the distal urethra to the perineal membrane has been severed, there is little to offer in terms of reconstructive surgery.[5] One may try either to plicate the endopelvic fascia along the urethra, use nearby muscle flaps of the pubococcygeus muscle, or place a synthetic mesh.

Conclusion

A cystocoele is a common hernia of the anterior vaginal wall. As with any other hernia, an assessment must be made to determine the type of hernia, signs and symptoms related to the hernia, the medical status of the patient, and the need for conserva-

tive versus surgical treatment. If surgical treatment is decided upon, repair of the fascial defect with either delayed absorbable or permanent suture is recommended. Post-operative instructions given to the patient should include no heavy lifting, excessive straining, or strenuous exercise, to allow for adequate healing and scar formation.

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Neil D. Jackson, MD

Since most patients with vaginal vault prolapse are post menopausal and often in the seventh or eighth decades of life, often serious concurrent medical problems make major surgery to repair the prolapse too risky.

"It's very embarrassing and I don't know how I can even ask you about it. I haven't been able to even look at what is happening down there. But I think my insides are falling out. For months I have felt this pressure in my bottom particularly when I bear down going to the bathroom. Then I began to feel this ball coming out of my vagina. It has become increasingly difficult to move my bowels. Now I have to push on this ball in order to empty my bowels, and it makes me sick to do this. Am I hurting myself by doing this? Can it cause cancer by pushing on my insides like that? Is that a cancer down there? What's happening to me? I don't dare let my husband come anywhere near me. I wouldn't want him to know about this. He doesn't understand why I refuse his approaches. Can this thing burst and hemorrhage? I had a hysterectomy a few years ago, and the doctor told me that everything went well and that I would be all right. Did he do something wrong? A friend of mine has to put something inside that her doctor gave her. She says it sometimes bleeds and always has a bad discharge and odor. Is that going to happen to me? Is there anything that can be done for me?"

These and other questions are often the way patients with vaginal vault prolapse present to their physicians. Their imaginations often run rampant and they postulate all manner of horrible imagery. Frequently the patient is so scared that they hide the problem from everyone, including their physician. Exteriorization of the prolapsed vaginal tissues dries this moisture-requiring epithelium leading to cracking, excoriations and eventually bleeding. Bleeding terrifies the patient and finally she can hide her problem no longer. She confides in someone and eventually is led to medical attention, filled with fear and misunderstanding and embarrassed to the extreme. It is incumbent upon us as physicians to handle the situation with gentle sensitivity.

Etiology

Vaginal vault prolapse is a result of the interaction of several factors. The strength of supporting tissues in the pelvic cavity is responsible for the containment of our intraabdominal organs in the face of gravitational forces and moments of increased intraabdominal pressures as we go about our everyday lives. Muscular and connective components are involved in the maintenance of this support. But there is heterogeneity of genetically inherited tissue strength among races. Prolapse of pelvic structures is far common among Caucasians than blacks or Asians. Multiparity also plays a leading role in predisposing one to pelvic floor abnormalities, particularly if the obstetrical history is one of having large babies. Vaginal delivery of large infants is a factor but it is not only the delivery process that is responsible here since Caucasian women who have delivered by cesarean section are also at greater risk for pelvic floor abnormalities. Presumably the last trimester of carrying a large infant in and of itself is important, regardless of how it is delivered. A history of multiparity is not essential since it does occur in nulliparous women, though less frequently.

Diagnosis

Three structures traverse a woman's pelvic diaphragm—the urethra, vagina and rectum. These three sites of egress are the points of origin for protrusion of structures normally maintained above this level. This is what is referred to as pelvic prolapse in its various manifestations. On first seeing a significant bulging of the vaginal walls, several possibilities must be considered. A cystocele, a rectocele, an enterocoele, vaginal vault prolapse, or a more obvious uterine prolapse can present in this way singly or in combination.[1] Observation and palpation applied in a systematic manner can often identify each of the elements involved. In very specific terms uterine prolapse is the result of, not the cause of, genital prolapse.

With the patient in the lithotomy position and with the prolapsed bulge reduced, if we ask the patient to bear down and the cervix and uterus first appear, one can gather that there is failure of support of the upper vaginal vault and attention should directed to its repair at the time of surgery. If, however, the first to appear is the anterior vaginal wall then the site of principal weakness is the support to the mid or lower vagina with cystocele formation. The same is true of the posterior vaginal wall and the presentation of a rectocele. One can separate the extent of anterior and posterior wall defects with the single blade of the vaginal speculum; retracting first the anterior wall followed by straining and then the posterior wall in like manner, assessing then the degree of prolapse of each.

The full extent of vaginal vault prolapse can best be appreciated by examining the patient in the standing position with her legs slightly apart and one foot on the step of the examining table and the other on the floor. At this time a rectovaginal examination with the patient bearing down will not only gain appreciation of the extent of the vaginal prolapse, but if there is further imposed separation of the rectal and vaginal examining fingers one can suppose the presence of an enterocoele. Appreciation of an enterocoele is important since, if not carefully treated at the time of corrective surgery, it can lead to further development and ultimate failure of vault prolapse surgery.[2] Enterocoeles usually present between the rectum and posterior vaginal walls. Anterior enterocoeles do occur but are less common.

Patients with vaginal vault prolapse commonly complain of urinary stress incontinence due to the displacement and hypermobility of the proximal urethra and bladder neck, present in accompanying cystoceles. There also may be no urinary incontinence when the patient is first seen. A careful history reveals that incontinence was a factor in the past and with progression of the vault prolapse the incontinence abated. In such a case the advancing prolapse has imposed secondary kinking of the urethra with resultant fictitious correction of the incontinence. If not studied urodynamically preoperatively to uncover such a situation, surgical correction of the vault prolapse with inattention to the need for anti-incontinent surgery, as well, may lead to incontinence post-operatively. A wet patient after surgery who was dry before surgery is not fertile ground for happy surgeon-patient relations.

Management of Vault Prolapse

The first step in the management of vaginal vault prolapse or eversion is an appreciation of the circumstances in which

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it may occur. Anyone who has genital prolapse is in an increased risk group for having or developing vaginal vault prolapse. We said earlier that a "dropped uterus" is not the cause but rather the result of genital prolapse and weakness of the supporting structures of the pelvis. If an individual is having a vaginal hysterectomy the strength and tension of the uterosacral and cardinal ligaments must be assessed. Redundant peritoneum between the uterosacral ligaments should be excised and the ligaments used to support the apex of the vaginal cuff. One such method is the New Orleans or McCall cul-de-plasty[3] wherein the medial segments of the uterosacral ligaments are brought together, reefing the peritoneum between and suturing them to the vaginal apex. This provides closure of the pouch of Douglas, prevents enterocele potential and supports the vagina cranially.

When severe vaginal vault prolapse is first seen it often is accompanied by excoriations and ulcers. In consummate need of moisturization the vaginal mucosa easily dries when exteriorized, particularly in the postmenopausal patient with vaginal atrophy who is not on estrogen supplementation. Replacement of the vagina and estrogenization with local estrogen cream (1g per vagina at bedtime once or twice per week) will soon lead to total healing. Replacement of the vagina with a pessary—either a flexible ring or a flexible gelhorn pessary is all that is needed. It is important to stress that these be of the flexible variety particularly in the case of the gelhorn. The rigid variety can lead to proximal stenosis over the flange of the gelhorn and entrapment of the pessary in the vagina.

Since most patients with vaginal vault prolapse are postmenopausal and often in the seventh or eighth decades of life, serious concurrent medical problems make major surgery to repair the prolapse too risky. In these patients less invasive management is essential. Patients can be maintained on pessary support indefinitely. With weekly application of vaginal estrogen cream to keep the vaginal mucosa well cornified many patients can be taught to insert, remove and clean the pessary regularly thereby averting discharge and odor. If the patient is unable or unwilling to service the pessary herself, the visiting nurse service or the doctor's office can do it every 6 to 8 weeks. At each visit the vaginal canal can be cleansed with a Betadine solution and inspected for any mucosal reaction to the pessary. If such is present then the pessary can be left out for a few days to allow for healing and then replaced when healing has occurred.

Some patients with severe prolapse and a wide sub-pubic arch are unable to retain any variety or size pessary. If, because of their limiting medical problems they are not candidates for major surgery, they present a very difficult management problem. In the past, limited surgical procedures such as the Lefort operation to obliterate the vagina using local anesthesia has been proposed. It has shown a high potential for recurrence, often is associated with significant blood loss at surgery, and frequently requires supplemental anesthesia for pain relief during the procedure. More recently a limited partial closure of the perineum under local anesthesia has met with early success.[4] It can be done in about 15 minutes under local anesthesia infiltration, is not associated with significant blood loss, and if it doesn't completely hold back the prolapse at the very least pessary retention is now possible. Only a few patients have undergone this procedure since it has such a limited application. but the results are encouraging.

In those patients who can undergo definitive surgical correction, support to the vaginal apex can be accomplished both vaginally and abdominally. The preferred approach is transvaginally using the uterosacral ligament in the posterolateral pelvis. With the left lateral position of the rectosigmoid, the right sacrospinous ligament is somewhat more accessible and is used more frequently for this operation. Either ligament can be used, however.

In the sacrospinous ligament vaginal fixation operation the posterior vaginal wall is opened longitudinally and carried to the vaginal apex. The corresponding pararectal space is entered by piercing the overlying endopelvic fascia and retracting the rectum medially. The dissection is carried down to the ischial spine and the fat overlying the ligament removed. Two finger breadths medial to the spine avoiding the pudendal vessels and nerve, permanent sutures are placed through the ligament. Care is taken to not go behind the ligament so as not to injure the sciatic nerve. These sutures then act as pulleys when attached to the underside of the vaginal apex and allow direct approximation of the vaginal apex to the sacrospinous ligament when tied down. Additional care is made that there is direct contact of the vagina to the ligament so that permanent fixation scar tissue between the two structures will avoid recurrence.[5] Following this the vagina is closed after correction of whatever posterior compartment defect in the vagina coexists.

After the operation there is a lateralizing vector configuration of the proximal vagina but this is imperceptible to the patient and to her sexual partner.[6] The proximal vagina now lies more horizontal in the hollow of the sacrum and during valsalva maneuvers is compressed antneroposteriorly and thereby prolapse is less likely to recur.[7]

Transabdominal approach to vaginal vault prolapse is a far more formidable procedure and is reserved for cases of recurrence of vaginal vault prolapse or for cases in which concurrent disease of the pelvis requires abdominal surgery (ie, large uterine or ovarian tumors or malignancies). In this procedure the cul-de-sac is approached from above and the apex of the vagina identified and secured. The parietal peritoneum of the vagina is opened and the peritoneum over the sacral promontory is opened as well. A tunnel is made under the peritoneum between these two points and a strip of mersilene mesh is led through this tunnel and sutured to the vagina and the sacral promontory carefully avoiding the middle sacral vessels,[8] bringing the vagina in closer proximity to the sacrum, restoring its normal length and elevation. Any redundancy in the posterior cul-de-sac or frank enterocoele can then be repaired by a Halban or Moschowitz procedure.

Summary

Patients with vaginal vault prolapse are more frequently found in the postmenopausal age group and often delay seeking help for a myriad of reasons. A sensitive physician can provide support throughout the required comprehensive work-up. Choice of therapy depends upon the overall assessment of the patient with both conservative and more invasive definitive therapies available. The result of either approach can lay the patients fears and misunderstandings to rest and return her to a more complete and fulfilling life.

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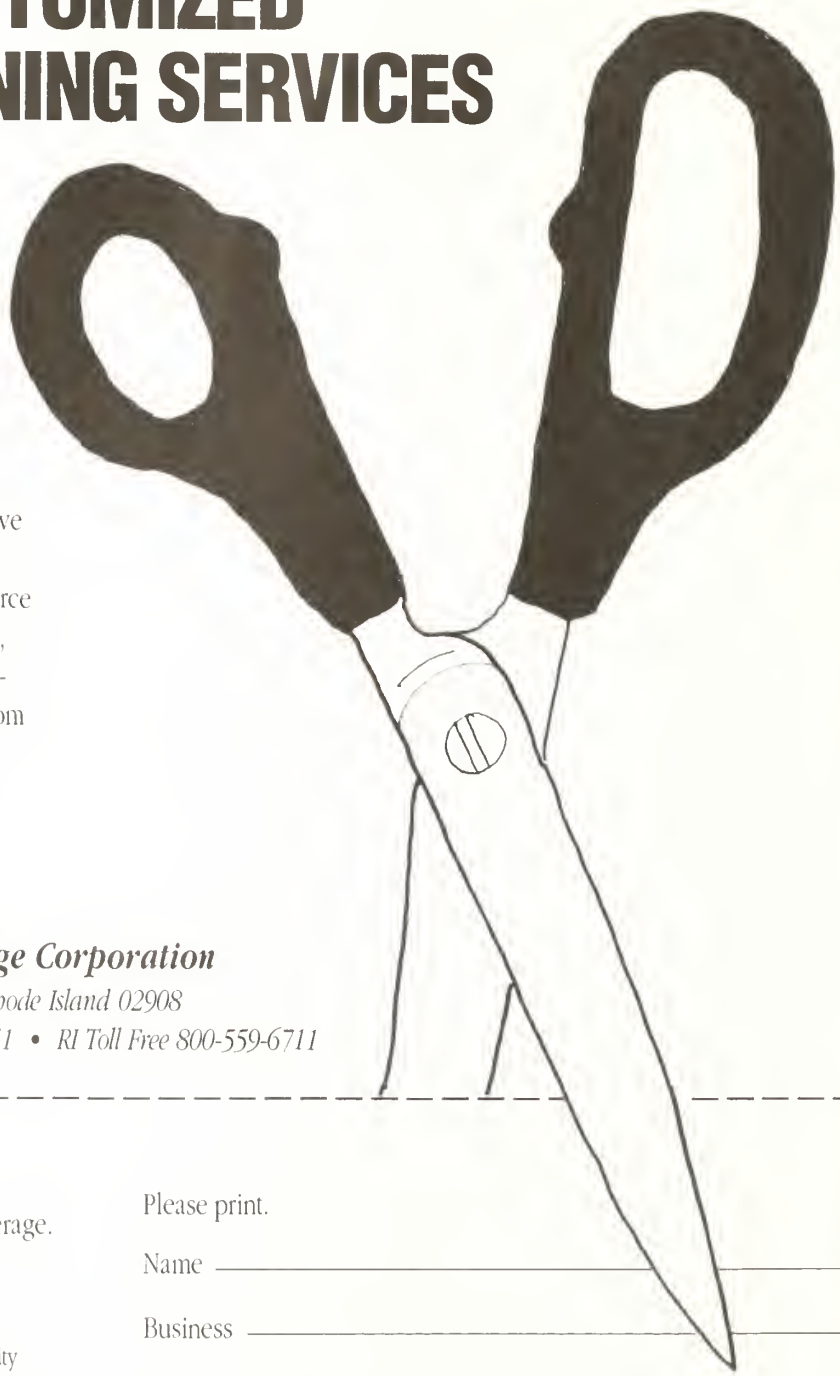

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'You May Think I'm Too Old, But Can't You Treat My Cancer?'

Paul A. DiSilvestro, MD, C.O. Granai, MD, Walter H. Gajewski, MD, Stephen S. Falkenberry, MD

. . . many older patients themselves resist indicated surgery for undue fear of operative-risk and a sense of their naturally limited longevity.

The fundamental relationship between age and cancer seems inevitable. Before the 1900s, however, life expectancy was so limited that as a practical matter, death from cancer was not a concern. Today things are different. Greater longevity, exposure to carcinogens, and other factors, bring more cancer and certainly a heightened awareness of the disease across society.

Current Trends

In the US, like other industrialized nations, demographics are changing. Currently 30 million Americans, about 11% overall, are beyond age 65. By the year 2000, this proportion will increase to 13%, and further to 22%, 65 million people, by 2050.[1] With increased aging will come more malignancy, and the need for better treatment, directed at preserving quality-of-life, in addition to increasing survival.

A concerning current trend, with public health implications, is that less routine gynecologic surveillance is occurring among aging women. One consequence is that cervical cancer, potentially preventable through pap smear screening, is now increasing in women over age 65. The Cleveland Clinic reported[2] women over 75 had symptomatic cervical cancers for 8 months before diagnosis. On average, these patients had gone 5 years without a gynecological exam or pap smear. If done, cervical screening may well have led to the diagnosis while the neoplasm was premalignant or asymptomatic (ie, at lower stage).Besides cervical cancer, cancers of the lung, colon, breast, ovary, uterus, cervix, and vulva also inordinately affect the aging female population.

Logical But Erroneous

It has been erroneously believed that "elderly" people (some dare define this as over age 65) are too old to withstand standard cancer treatment. Medical experts stereotyped the elderly as less physically tolerant, hence incapable of enduring strenuous therapies. In consideration of the elderly's interest, then, and for reasons of cost/benefit, standard cancer treatment has often been thought better applied to younger patients. These assumptions are derived in part from the recognition that physical declines of aging are inevitable and from composite medical data indicating a poorer outcome and decreased survival among older cancer patients. But these data are misleading.

A 1993 study by Hightower et al[3] examined the premise that poorer outcomes occur among elderly patients treated for ovarian cancer. Twelve thousand women with ovarian cancer were studied, 1000 of whom were age 80 or above. Seeming to support the "less-tolerant" stereotype, gross statistics showed significantly reduced survival, stage for stage, after age 80. For example, only 11% of older women with Stage III epithelial ovarian carcinoma were alive after 5 years, compared to 25% of their younger counterparts. Thoughtful data-analysis, however, reveals a different story. Decreased survival was not a straight-line function of age alone. Other factors were seen contributing to poor outcome, most particularly, older patients were given more conservative (lesser) cancer treatments. In contrast, the younger patients were more likely treated by subspecialty trained oncologists/surgeons employing maximal interventions (eg, debulking, surgery, and dose intense platinum-based chemotherapy). Naturally then, the suboptimal treatment given to older women resulted in shorter survival.

Pervasive Bias

The reasons older people often receive lesser treatment is not based entirely on physician-bias.[4] To the contrary, such bias is pervasive in society, families, and the elderly themselves. Consequently, many older patients themselves resist indicated surgery for undue fear of operative-risk and a sense of their naturally limited longevity. Both assessments are often unjustified. Today, for example, the typical 65-year-old can expect to live 18 more years. Indeed, women reaching age 80, on average, live another 8 years and if age 90, another 4.5 years.[5] These statistics indicate the importance of a more-informed, contextual analysis being done before decisions are made about operative/treatment benefit and age.

Several authors have considered the question. Gilbert's article entitled, "Principles of Surgical Risk Assessment of the Elderly Patient"[6] assessed cogent risk-factors for operative morbidity in the elderly population. Several relevant conclusions were drawn. The most sweeping is that the elderly should no longer be seen as poor surgical candidates simply because of their numerical age. Chronologic-age alone, as a criterion for estimating operative-risk, was not a factor in post-surgical mortality. Rather, the paper encourages the concept of biologic age—incorporating an individual's unique physiologic and pathologic changes—as a more useful prognostic factor than absolute chronologic-age. In keeping with this suggestion, Gilbert notes that the American Society of Anesthesiologists (ASA) classifies risk for perioperative mortality regardless of age. In the ASA's considerable experience, upon which their risk stratifying system is based, normal, healthy patients (ASA Class I) over the age of 80 have a 0% surgical mortality rate. Moreover, even at ASA Class 2 and 3, denoting substantial systemic disease causing functional limitation, operative mortality is still low (<5%).

Not in a Vacuum

Gilbert's report and the broader gerontology literature remind us that aging and disease are not synonymous. Neither can be considered in a vacuum. But of the two, it is disease that usually has the greater impact on risk. The elderly, however, do have decreased functional reserve, limitations that may not be obvious during normal activity. Surgery, radiation therapy, and chemotherapy are not ordinary stresses and, as such, may uncover functional limitations. Therefore, physicians treating the elderly must be aware of the need for close intra-operative and postoperative monitoring and additional supportive care older cancer patients may need. But, so too, must responsible decisions for, or against, cancer treatment must consider not only the possible consequence and complications caused by treatment, but the potential benefits, as well as the often far worse consequences, of "no treatment" (ie, uncontrolled cancer).

Gynecological Cancer

Ovarian cancer is today's most notorious pelvic malignancy in women. As a group, ovarian cancers rank fourth as a cause of cancer-death among women. Like most cancers, the incidence of ovarian cancer increases with age, with more than half occurring after age 65. The age-adjusted death rate from ovarian cancer has, for the

ABBREVIATIONS USED
ASA: American Society of Anesthesiologists

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elderly, increased 16% in contrast to younger women where it has actually decreased 25%.[7,8] Why this discrepancy? A truism unfortunately applied to many malignancies, but often elderly patients with ovarian cancer have been assumed unable to tolerate the treatment considered most effective, radical surgery and chemotherapy and their potential substantial side effects. Thus, elderly patients have received lesser/less cancer treatment with correspondingly poorer outcomes.[3,9] But assumptions about tolerance to treatment, based solely on chronologic-age, have proven wrong.[10] It is, then, important for clinicians to disregard incorrect truisms and remember that age alone is not a significant independent prognostic factor for survival with ovarian cancers.[11]

At the Cleveland Clinic,[2] 114 women above age 74 were diagnosed with gynecologic cancers (12% ovarian, 36% endometrial, 25% cervical, 19% vulvar, and 7% vaginal). One hundred and ten underwent a major surgical procedure. No postoperative mortalities occurred, indeed 77 experienced no postoperative morbidity. Consistent with their disease, 22 patients went on to receive chemotherapy, with 1 related mortality. Only four patients of the original 114 did not receive standard cancer therapy, because of extremely advanced disease where known treatment has shown no benefit, or because of absolute medical contraindications to therapy. Cogent co-morbidities proved to be hypertension, coronary artery disease, and diabetes. Overall, the authors concluded that despite advanced chronologic age, barring unequivocal contraindications, optimal cancer therapy should be offered.

Similarly, Lawton et al[10] at the Royal Hospital for Women in Sydney, Australia investigated 226 consecutive gynecological cancer patients, 72 over age 70. Older patients presented with more advanced-stage disease and decreased performance status. Nevertheless, 90% of the elderly group were able to undergo radical cancer surgery (eg, radical hysterectomy, radical vulvectomy with groin node dissections, ovarian cancer debulking) with only a 1.5% operative mortality rate. Improvements in surgical techniques, hyperalimentation, anesthesia, intra/post-operative monitoring, and postoperative care, were seen contributing to the markedly decreased peri-operative mortality compared to that formerly associated with this age group. The postoperative morbidity-rate also compared favorably, 22% over age 70 versus 25% below. The study concluded that chronologic-age alone is a poor predictor of surgical and chemotherapy risk. In contrast to these treatment modalities, however, the study noted an increased radiation therapy complication rate—a 7% treatment-related mortality.

Fuchtner et al[12] studied two patient populations: 45 women over age 65, and 90 under that age. All had Stage IB or IIA cervical carcinomas and underwent radical hysterectomy and lymph node dissection as primary treatment. No difference in operative morbidity or mortality was observed between age groups. Neither was there difference in the 5 year cancer-specific survival rates. Geissler et al[13] also evaluated outcome in women over age 65 having had radical hysterectomy. Along with thyroid disease, hypertension, coronary artery disease, and diabetes mellitus were again cogent co-morbidities. Overall, however, he too found that lacking significant medical co-morbidity older patients tolerated radical surgery well. As did the Australians, Geissler noted a decreased efficacy of radiation therapy—the traditional treatment and alternative to radical surgery for cervical cancer in this age group. It may be that the poorer outcome with radiation results from lesser tissue perfusion indigenous in older patients. A direct relationship between good tissue perfusion/oxygenation and effective radiation treatment, is long since established.

Recently, we reviewed our experience in treating elderly cancer patients. From 1991 through 1993, 80 women over age 80 were diagnosed and treated at Women & Infants Hospital for major gynecologic malignancies. Their operative procedures included: radical vulvectomy, radical hysterectomy, and ovarian cancer debulking. In particular, the outcome of patients with endometrial cancer were analyzed since they are invariably treated (and cured) by surgery alone. Compared to younger patients, survival curves for elderly patients stage-for-stage were equivalent. As a group, these elderly patients tolerated surgery well and returned to their otherwise normal quality-of-life.

Conclusions: Time to Reconsider

Physicians and society must rethink their attitudes about treating cancer in elderly people. At the very least, the definition of "elderly" should be revised upward to reflect new demographics and improving overall health status of the aged. Even then, considering women over the age of 90, there is little evidence contraindicating proven cancer treatment for most.[14] Well meaning, but erroneous, stereotypes aimed at protecting elderly patients from undue suffering caused by aggressive cancer treatment, are laudable but must be reconsidered. The development of better, and less toxic cancer treatments, reinforces this imperative. Today, patients through the tenth decade not only deserve and desire the best possible treatment, they benefit from it.

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Errata

A typesetting error resulted in some confusion in the article "Childhood Lead Poisoning" by James G. Linakis, PhD, MD, appearing in the January 1995 issue of RHODE ISLAND MEDICINE. Throughout the article, the symbol for microgram was translated by typesetting equipment to a circle, and the error was not caught before the issue went to press.

Readers should be careful to note that all references to lead concentration levels in the article are measured in micrograms per deciliter.

We regret any confusion resulting from the error.

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Ovarian Cancer? What Is the Next Step?

C.O. Granai, MD, Walter H. Gajewski, MD, Paul A. DiSilvestro, MD, Stephen S. Falkenberry, MD

. . . each type of cancer should be managed clinically by oncologists/surgeons who understand that specific disease, and manage the neoplasm in accordance with its own, often unique, biology.

The clinical management of few diseases is as affected by misplaced stereotypes as ovarian cancer. For example, confronted by an often elderly woman with a massively distended abdomen, ascites and pleural effusion, an otherwise prudent clinician, led by previous experience and seeming common sense, frequently concludes that any treatment beyond palliative/comfort-measures-only is inappropriate. That is, the patient is presumed too old or too sick to endure a treatment unlikely to be helpful, so humanely the decision is made to step back. Other physicians will embark on extensive medical evaluations expecting to establish a relatively less-likely diagnosis (eg, liver failure) needing medical therapy. Still another scenario is pursuing exploratory laparotomy, neither anticipating the most likely finding of advanced epithelial ovarian cancer, nor being prepared to do the extensive surgery needed to maximize treatment. Though these well-intended approaches are all possibilities, when ovarian cancer is prominent in the differential diagnosis—what is the next step?

Background

Ovarian cancer is the leading killer among female pelvic malignancies in the US, where 26,600 new cases, causing 14,500 deaths, will occur this year.[1] Contrary to the widely held perception that ovarian cancer is a single disease, it is actually a heterogeneous group of biologically diverse neoplasms, often sharing only their anatomic site of origin, the ovary, in common. As such, generalizing about ovarian cancer is difficult and often misleading. Clinical suggestions regarding workup and management are best made by categorizing the many ovarian neoplasms into three groups, based on embryologic origin.[2]

Germ cell tumors (GCT) typically occur in females aged 10–25 years. Because of chemotherapy, GCTs are curable, even while preserving fertility in many cases. Proper surgical-staging and chemotherapy are essential if the otherwise rapid mortality of malignant GCT is to be avoided.[3]

Still rarer are **stromal tumors**, anachronistic neoplasms occurring at all ages. They are, however, stereotyped in their occasional hormone production (and the secondary symptoms and signs the hormones may produce). Biologically, most STs are of indolent behavior, but they sometimes can be lethal. As with all rare malignancies, defining optimal therapy based on historic literature is difficult.[3] Nonetheless, it is clear that surgery plays a central role and advanced/recurrent stromal cancers can respond to chemotherapy in a meaningful way.[4] True, with GCTs as well, clinical management of stromal tumors is best rendered by physicians experienced with these uncommon ovarian malignancies.

Epithelial ovarian cancer (EOC) is the third and dominant subcategory, constituting 70% of malignant neoplasms in the ovary. In contrast to GCTs, EOCs generally occur after menopause, are blatantly diffuse/advanced at the time of diagnosis, and are rarely curable.[5] Considering their relative frequency, poor outcome, and the notoriety brought by celebrities who have died from the disease, it is understandable why society, and many physicians, believe EOC is "ovarian cancer."

Early Diagnosis: An Ideal

Diagnosing EOC, while still at an early-stage, is usually fortuitous. At the outset there are no symptoms, nor specific findings, laboratory tests, or ultrasound results that can be relied upon to help. Ovarian cancer "screening" programs have, thus far, failed to establish the diagnosis at a point in the disease process when treatment would potentially alter ultimate outcome. The appealing logic of CA125 and ultrasound screening programs have raised the hopes of an understandably frightened public. Unfortunately, as determined by an NCI consensus-panel, screening benefit has not been demonstrated from these tests which lack sufficient sensitivity and specificity for such purpose.[6] Therefore many women are being falsely reassured by "negative tests," while others with non-malignant processes (eg, leiomyoma, endometriosis) are needlessly frightened further, or operated upon, because of false-positive tests.[7]

Early Disease

If early ovarian cancer (of any cell type) is encountered (invariably during laparoscopy/laparotomy), what is the next step? The answer is, of course: it all depends. The type of malignancy, patient age, fertility desires and other factors, considered and discussed before surgery, all come into play. However, in any scenario where visually the disease appears confined to one or both ovaries, (ie, Stage I), surgical staging becomes of paramount importance to all scenarios. Surgical-staging entails compulsively performing specific, prescribed biopsies and cytologic sampling throughout the abdominal cavity and retroperitoneum.[8] Postoperatively, the information gathered from surgical-staging creates the most accurate understanding of disease distribution, tumor grade, cell type, etc. From this, prognosis can be predicted, and need for subsequent chemotherapy then determined.

Assuming the intraoperative diagnosis on frozen section is EOC, and that the patient is post childbearing, in addition to carrying out comprehensive surgical-staging, hysterectomy and removal of the contralateral ovary are usually undertaken. The latter procedures enhance staging by allowing further assessment for concurrent disease—not uncommonly coexisting or metastatic in the visually normal appearing gynecologic organs. However, in the entirely different clinical situation of a young patient with a unilateral GCT, hysterectomy and resection of the normal contralateral ovary are not indicated.[2] Rather, only the grossly-involved ovary need be excised, done in conjunction with surgical-staging. The visually normal reproductive structures are left *in situ*, even in cases of advanced GCT involving the lymph nodes; and thus fertility usually remains intact.

Coming back to the question then: if

ABBREVIATIONS USED
AFP: Alpha feto protein
EOC: Epithelial ovarian cancer
GCT: Germ cell tumor
HOG: Human chorionic gonadotropin
NCI: National Cancer Institute
ST :Stromal tumor

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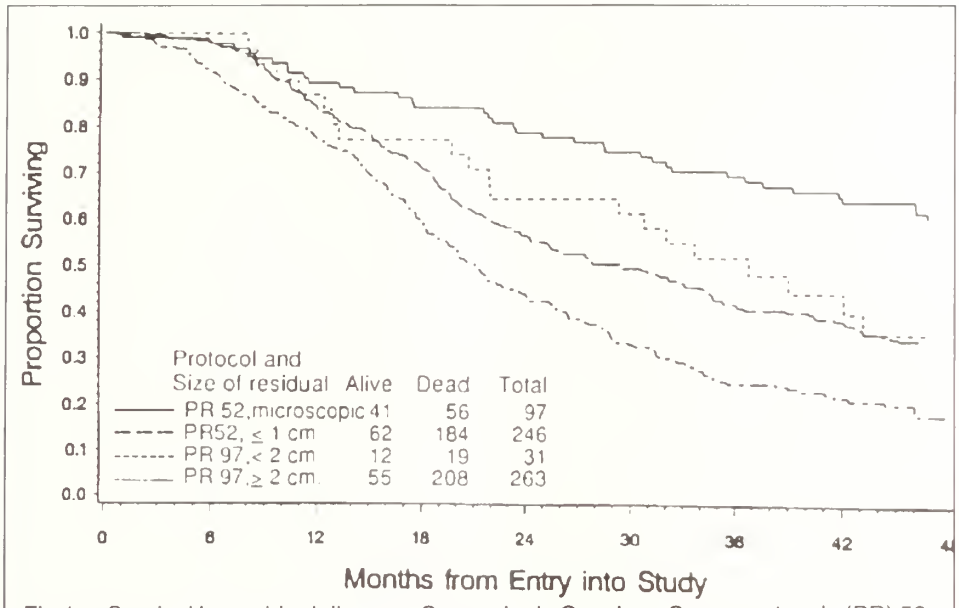

Fig 1.—Survival by residual disease. Gynecologic Oncology Group protocols (PR) 52 and 97.

"early disease" is suspected, what makes sense? After a brief, limited workup, including the appropriate tumor markers (eg, CA125, AFP, HCG, inhibin), exploratory surgery is invariably the next step. If apparent early ovarian cancer is encountered, surgical-staging is done, along with those other procedures as indicated in the context of the individual patient and the biology of the malignancy encountered.

Advanced Disease

Unfortunately, at initial laparotomy (ie, time of diagnosis) 80% of women with EOCs will have visibly overt/advanced disease, often of massive proportion existing throughout the abdomen and pelvis. What's the next step then? Despite the seemingly insurmountable picture of unresectability, 80% of such cases can be "optimally" resected by experienced surgeons.[9] Debulking a massive EOC tumor volume downward to an *in situ* residual of less than 2 cm in diameter, has been shown in numerous retrospective studies to be of significant therapeutic value when done as part of the overall treatment strategy that includes proper postoperative chemotherapy[10,11] (Figure 1). Not a Halsteadian concept, and therefore counterintuitive to most surgeons, care must be taken to guard against their prematurely curtailing the operation, short of achieving optimal cytoreduction, unless absolutely forced to do so by truly unresectable tumor involving vital anatomic sites.

Surgeons inexperienced with EOC, cytoreductive operative techniques, and the considerable morbidity associated with debulking, who find themselves unavoidably confronted with advanced disease, are advised, if possible, to obtain an intraoperative consult. If no consultation is available, surgery should be limited to establishing the diagnosis (limited biopsy) since partial debulking is of no advantage.

Immediately after operation, referral to a gynecologic oncologist should be made regarding further (operative) intervention. The basis for this pointed recommendation is published outcome-studies showing significantly better long-term survival correlates with: optimal debulking, dose-intense chemotherapy, and the type of surgeon operating.[9,12,13] In these studies, gynecologic oncologists, as a subset of surgeons, were much more frequently able to achieve optimal debulking, with statistically significant longer survival (Figure 2). The endorsement here is not of gynecologic oncology *per se*, but the important concept that each type of cancer should be managed clinically by oncologists/surgeons who understand that specific disease, and manage the neoplasm in accordance with its own, often unique, biology. Principles that apply to one cell-type, or even to groups of malignancies, cannot be presumed applicable to all solid tumors. The inherently different biologic behavior of neoplasms must be recognized, understood and contended on their own terms. To do otherwise is less than the best medicine can do.

What Is "Cost-Effective"?

Today, physicians are asked to balance what is reasonable medically, and what is cost-effective. Consider again the elderly woman with a distended abdomen and ascites, how do we balance? In this particular patient, the diagnosis of EOC is a prominent possibility. Nevertheless, a minimal workup, including CA125, is usually sufficient prelude to the next, and key diagnostic-step; exploratory surgery.[14] Indeed, surgery becomes the next and primary intervention, almost without regard for patient age,[15] clinically anticipated diagnosis, or assumed stage-of-disease.[5] Preoperative diagnostic testing (needle biopsies, paracentesis and gastrostomies) are generally meddlesome, risk disseminating disease, and typically do not alter the ultimate need for surgery. As such, they become costly procrastination.

Elderly patients in general have a far

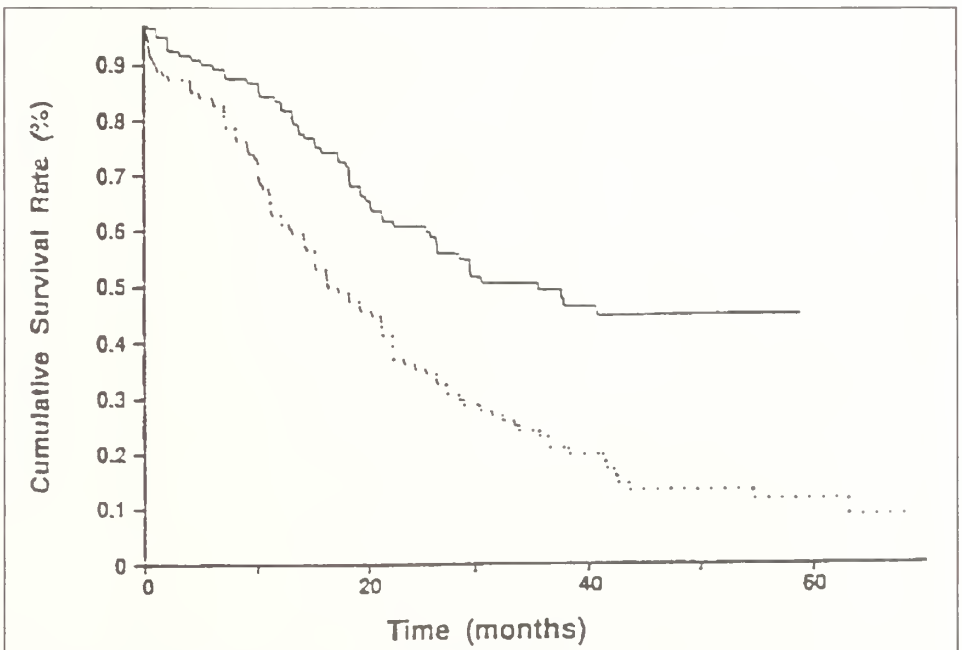

Fig 2.—Cumulative proportion of survival subdivided by subspecialty training of surgeons present. Solid line, gynecologic oncologist present. Dotted line, gynecologic oncology absent. $P<0.0001$.

greater tolerance for major surgery than might logically be expected. As a single parameter, chronologic-age should not be invoked as the obviator of a maximal cancer management which includes aggressive surgery. Current EOC treatment (debulking surgery and dose-intense chemotherapy) results in meaningful palliation of symptoms and a resumption of normal life, off treatment, for most; and, for 20% to 40% of those same patients who began with seemingly insurmountable disease, after treatment disease-free survival exceeds 4 years.[9,10,16] Alternative strategies such as chemotherapy alone (without surgery) are not equivalent, thus should be reserved for those rare patients who, cognizant of the relative options, still wish to decline surgery, or for those in whom surgery is absolutely medically contraindicated.[10,17]

Extreme Imprecision

Beyond its therapeutic value in managing ovarian cancers, surgery as "the first-step" also prevents serious misjudgments in diagnosis, thus avoiding misdirected therapy. Symptomatic patients presumed to have advanced ovarian cancer based on the presence of a pelvic/abdominal mass, ascites and pleural effusion, surprisingly sometimes are proven by surgery to have benign or borderline neoplasms that are cured by simple resection. In still other patients, malignancies from extraovarian sites (eg, colon, lymphoma, breast) mimicking primary ovarian cancer are found occupying the pelvis or metastatic to the ovary. The extreme imprecision of diagnosing "ovarian cancer" on clinical and radiographic grounds, often results in experienced clinicians being profoundly deceived, hence misdirected. The genuine insight provided only by initial surgery, reinforces its strategic role in clinical situations where the diagnosis of ovarian cancer is considered.[5]

Conclusion

So then, with ovarian cancer, what is the next step? After all this the answer has to remain: it all depends. Circumstances of the moment, tumor biology, the patient's wishes, age and where in-theprocess things stand, all are considerations. Still, when a presumed (or proven) diagnosis of ovarian cancer is before us, certain principles should prevail. Keep things simple, direct, and in the hands of physicians experienced in treating such patients surgically, as well as medically (Figure 2). Avoid detours provoked by: well-intended but misguided stereotypes, a presumed diagnosis and stage (not actually established), or a one-dimensional decision that concludes that the patient is too sick or too old to undergo the best treatment possible. Too often left out of the decision-making equation are the realities that untreated cancer has its own, usually worse, consequence, and that in only 6 months of quality survival (let alone 3 years) more can be achieved than many will do in a lifetime.

"The best" ovarian cancer treatment usually means initial surgery and doing the appropriate operative procedures—appropriate to that patient's specific findings and needs. Then, based on an accurate, detailed understanding of the pathology and tumor distribution, dose-intense systemic chemotherapy, itself enhanced by the optimal surgery already performed, can be given, and will benefit most patients. It is unfair that the "next step" be something less, simply because the clinical picture seems dubious and overwhelming or that a forever-cure is beyond our current medical means. These principles extend far beyond oncology. Well intended, but misguided stereotypes about disease and age, therapeutic analogies erroneously drawn between biologically unrelated diseases, and the uneducated and different priorities of third-party reviewers, should not deter the experienced physician from providing patients the best opportunity for meaningful recovery.

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Patricia A. Nolan, MD, MPH
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Edited by Jay S. Buechner, PhD
Chief, Office of Health Statistics

Hospitalizations for Urinary Tract Infections, 1993

Infections of the urinary tract are a major cause of hospitalizations in Rhode Island. In the 12 months ending September 30, 1993, there were 8,350 discharges from hospitals in the state with a primary or secondary diagnosis of kidney infection, cystitis, or urinary tract infection of unspecified site, comprising 6.7% of all non-newborn discharges. During calendar 1992, the comparable figure nationally was 6.1%.[1]

Urinary tract infection (UTI) or septicemia with UTI was the principal diagnosis in 1,963 of these hospital discharges, with kidney infections accounting for one-fifth, septicemia with UTI accounting for one-quarter, and UTI, site unspecified, accounting for nearly half (Figure 1). In the remaining 6,387 hospital discharges, UTI was a complication or co-morbidity affecting treatment and recovery.

Seventy-four percent of the 1,963 hospitalizations with a principal diagnosis of UTI or septicemia with UTI were either for middle-aged persons (45-64 years) or for elderly persons (65 years or older). Within this broad age range, the rate of hospitalization for these conditions increased substantially with age, the rate for persons ages 85 and older being over 20 times higher than the rate for persons ages 45 to 54 (Figure 2). A majority of the discharged patients were women (63%). Within four of the five age groups, the rate of hospitalization was higher for females than for males.

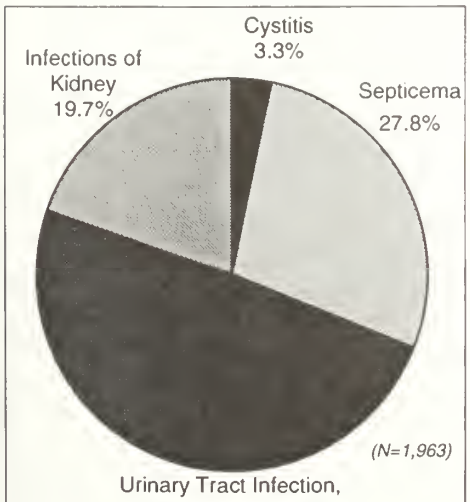

Fig 1.—Hospital Discharges for Urinary Tract Infections, by Principal Diagnosis, Rhode Island Hospitals, October 1992–September 1993.

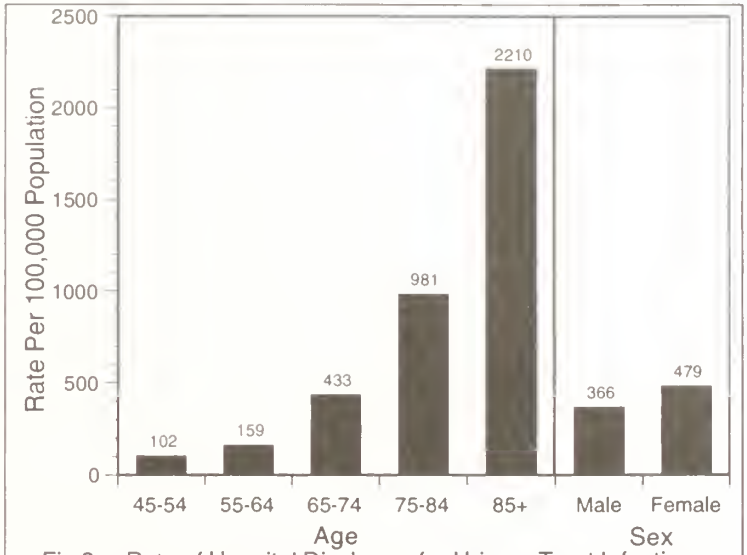

Fig 2.—Rate of Hospital Discharge for Urinary Tract Infections, by Age Group and Sex, Ages 45 and Older, Rhode Island Hospitals, October 1992–September 1993.

Among the 1,205 elderly patients with UTI-related principal diagnoses, only 38% were discharged under "routine" circumstances (Figure 3). Over half (51%) were discharged to lower levels of care such as nursing homes and home care, 8% died in the hospital. A higher proportion of males was discharged dead (10%) than females (7%), and a higher proportion of females was discharged to nursing homes (38%) than males (28%).

National survey data show that "acute urinary conditions" are a common ailment among the general population, with over 7.5 million reported episodes (30 per 1,000 population) requiring medical attention or restriction of activity in 1993.[2] Among the elderly, the rate of incidence is higher (51 per 1,000), but not nearly so elevated as the rate of hospitalization. Thus, for the elderly, an episode of UTI carries an increased risk of hospitalization and can develop into a debilitating and potentially life-threatening condition.

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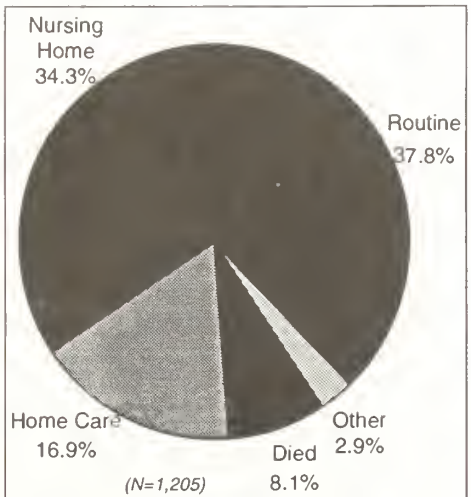

Fig 3.—Hospital Discharges for Urinary Tract Infections, by Discharge Status, Ages 65 and Older, Rhode Island Hospitals, October 1992–September 1993.

Submitted by the Office of Health Statistics, Jay S. Buechner, chief. Health by Numbers *is edited by Jay S. Buechner, PhD, and William J. Waters, Jr., PhD*

Public Health Briefings

Rhode Island Department of Health
Patricia A. Nolan, MD, MPH, Director

Edited by Judith Feldman, MD,
John P. Fulton, PhD, and Bela Matyas, MD

From the Podium: Sodium?

Joann M. Lindenmayer, DVM, MPH
Kim M. Gans, PhD, MPH, LDN
Nancy Beauchene, MS, RD

Ten years ago low sodium (*Na*) foods were not readily available. Today, many processed foods occupy shelves next to low *Na* equivalents, the result of a campaign to reduce dietary *Na* among Americans. This represents a shift from decisions made by providers in the context of provider-consumer relationships to public health policy. The implications are not trivial. In fact, whether we should support such a policy is a hotly debated question. This briefing will examine some of the issues involved in the current debate, and review the evidence for (PRO) and against (CON) reducing dietary *Na* in the population.

Background

The gradients of risk for myocardial infarction, thromboembolic stroke, and other sequelae of hypertension are continuous with increases in systolic or diastolic blood pressure ("BP"). However, for people ages 18 and over, optimal blood pressure measurements with respect to cardiovascular disease risk are <120 mm Hg (systolic) and <80 mm Hg (diastolic). The third National Health and Nutrition Examination Survey (NHANES III) estimated that 50 million adult Americans (about 25%) have high blood pressure ("HBP"), and that nearly 60% of people ages 60 and over have it. The RI population is older than the US population, hence the expectation that hypertension is more prevalent in RI than the US.

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Dietary *Na* and BP

PRO: Evidence links *Na* consumption and heredity to the initiation and development of primary hypertension in some people. Certain strains of laboratory rats develop hypertension on high *Na* diets. A number of studies, notably the multi-national INTERSALT study,[1] which examined the relation between BP and *Na* excretion (as a proxy for *Na* intake), have revealed differences in the prevalence of hypertension among racial, ethnic, and cultural groups. In the US, the prevalence of hypertension is greatest among African Americans and people with a family history of hypertension, suggesting that heredity contributes to the clinical expression of hypertension. The INTERSALT study also revealed a significant linear relation between *Na* excretion and the *slope* of systolic BP with age for all 52 study groups. In the US, hypertension is far more prevalent among elders than younger people. This fact has been cited to support broad-based dietary *Na* restriction earlier rather than later in life.

CON: In the INTERSALT study, the apparently significant linear relationship between *Na* excretion and mean BP is weaker when four distinct groups (including the Yanomano Indians in Brazil) are excluded.[1] INTERSALT study critics also have shown that the age-related rate of increase of systolic BP is inversely proportional to initial systolic BP, ie those with HBP earlier experience less increase in systolic BP later.

Effects of *Na* Restriction on BP

PRO: Reducing dietary *Na* intake is an accepted part of the management of people with hypertension. Prospective randomized clinical trials of low *Na* diets in hypertensive individuals provide evidence that such management is appropriate. The mean decrease in BP, about 5 mm Hg, is clinically significant. Of all people with hypertension, about 25% are "salt sensitive," i.e., responsive to dietary *Na* reduction, but there is no simple test to tell who is salt sensitive and who is not. Because salt sensitivity is reasonably prevalent among hypertensive people, because it is difficult to identify, and because the effect of *Na* restriction is meaningful, recommending that hypertensive patients reduce *Na* intake is sound. People with high normal BP are also at increased risk for developing hypertension later in life. Restricting dietary *Na* in this group also decreases BP, though less than among those with established hypertension.[2]

CON: Three-quarters of persons with hypertension do not respond to dietary *Na* restriction. Recommending *Na* restriction for people with high normal BP further dilutes its expected benefits. In fact, *Na* restriction has little or no observed effect on BP in normotensive persons.[3] Also, no prospective randomized data exists to support the widely held belief that restriction of *Na* consumption among normotensive people prevents hypertension. Although *Na* and BP are related in some groups, and BP and morbidity/mortality are related, no studies have clearly shown that restricting dietary *Na* decreases morbidity/mortality.

Other Health Consequences of *Na* Restriction

PRO: Average dietary *Na* exceeds requirements; restricting *Na* would have few deleterious effects and might reduce the incidence of gastric cancer in some people.

CON: When *Na* intake is reduced to levels necessary for clinically significant reductions in BP,[4] side effects may emerge, including severe fatigue secondary to hyponatremia, and among some, a paradoxic BP increase, possibly caused by the increased vasoconstriction necessary to maintain BP. Evidence linking *Na* consumption and gastric cancer is not strong.

ABBREVIATIONS USED

BP: Blood pressure
HBP: High blood pressure
JNC: Joint National Committee
Na: Sodium
NHANES: National Health and Nutrition Examination Survey
NRC/NAS: National Research Council/National Academy of Sciences

Persons Unaware of Their Hypertension

PRO: Many people with hypertension are unaware of it (almost 50% in Rhode Island, according to one recent estimate), and about 25% of these, who are probably salt sensitive, would benefit from a blanket recommendation for *Na* restriction.

CON: On a national level, HBP screening is so successful that national hypertension campaigns have shifted emphasis from BP screening to follow-up for HBP. The number of undiagnosed hypertensive persons is small. Scarce resources may be better used for assuring lifestyle changes and pharmacologic compliance among those with established hypertension.

BP and Other Factors

PRO: BP is affected not only by *Na*, but by other factors as well. Stress and high dietary potassium intake may interact with dietary *Na* to produce greater effects on BP than expected from each factor alone.

CON: The associations between BP and obesity and BP and alcohol use are stronger than the association between BP and *Na* intake. Focusing public health policy on *Na* restriction without attention to other factors would be inefficient.

If You Build It, Will They Come?

PRO: Dietary *Na* restriction has been an important national health policy for years. Several public health and scientific organizations, including the US Department of Health and Human Services, the National Research Council of the National Academy of Sciences, the American Heart Association, and the Fifth Joint National Committee on the Detection, Evaluation, and Treatment of High Blood Pressure have issued guidelines for *Na* restriction. The public's awareness of this message has contributed to the demand for low *Na* items. People think *Na* restriction is good and are trying to lower *Na* intake.

CON: How successful can they be? Reliable population-level data on this point are lacking. However, some studies have looked at the ease with which individuals adopt and maintain low *Na* diets. A review of *Na* interventions reported in the literature[5] suggests that dietary *Na* intake can be reduced to recommended levels (2400 to 3000 mg/day), but only by highly motivated individuals, usually those with overt hypertension and for whom anticipated health benefits are greatest, and only with intensive education and follow-up. These motivations and supports are lacking in the population at large, for whom the expected health benefits are less clear and success is difficult to measure. Alternative strategies have been proposed, including more modest goals for the public and widespread changes in prepared foods. The former would attenuate the expected benefits of such a policy, while the latter would require broad cooperation of the food industry and might increase food costs, at least initially.

The Physician's Role

There appears to be little doubt that *Na* restriction is a sensible part of the management of hypertension. The strength of the current *Na* debate reflects the strength of argument for each point of view. Until the debate is settled, physicians should consider incorporating advice on dietary *Na* restriction for patients at high risk for developing hypertension: African Americans, persons with a family history of hypertension, and the elderly. In addition, patients who are obese or who consume large amounts of alcohol may benefit from *Na* restriction. Persons who wish to restrict *Na* intake should be advised to limit the consumption of processed foods and the use of salt after food preparation. Together, these sources account for more than 50% of *Na* intake. Of course, any recommendations to restrict *Na* intake should be part of a comprehensive nutritional and physical activity plan, particularly for high-risk people.

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90 Years Ago (May 1905)

Both editorials discuss the diagnosis and public health relevance of cere brospinal fever and the associated meningitis. The number of recorded cases in recent months, says the editorial, has been negligible but warns its readers, nonetheless, of the epidemic potential of the intracellular diplococcus [as in the 1897 epidemic in Boston or the 1904 outbreak in the Connecticut Valley]. The etiology of meningeal infection is various, including tuberculosis, streptococcus and the pneumococcus - but it is the intracellular diplococcus that now elicits the greatest anxiety. The clinical features of meningitis, including its precipitous onset, are carefully reviewed. The grave outcome, in virtually all cases, is also addressed. An important epidemiologic feature is stressed: That the great majority of *diplococcus intracellularis* infections do not invade the meninges but confine themselves to local infections of the nasopharynx. Thus, "avoidance of the secretions by others is the avoidance of this and many other infectious diseases."

The annual medical society presidential address, this year offered by George S. Mathews, MD, discusses a variety of issues, the first being the need that physicians continue their personal education in the classics. They are urged to reread Shakespeare, Thackeray, Eliot, Goethe, Schiller and Dido - the latter three in their original languages. "All this recreative reading should be fostered, nurtured and encouraged, for in no small degree does it smooth the asperities of a physician's dally routine in life." The second issue raised by the author is the currently deplorable state of medical services in the U.S. Army. Compared with the Japanese or German miltary, he observes, we are incapable of providing the sanitary prevention and the medical care that our soldiers require. It is reminiscent, to the author, of the Tsarist Russian army sanitary trains without physicians, nurses, attendants—or even food—for upwards of a thousand wounded men. Lastly, Dr. Mathews asks the members of the Society to back the American Medical Association in its fervent support of pure food legislation currently before Congress. And, tangentially, Dr. Mathews also expresses deep concern over the nutritionally poor lunches served to students in the Providence high school. He concludes: "That the influence of our profession is to be exerted with an increasing impetus is clear. What part are we to take ?"

50 Years Ago (May 1945)

The lead article is written by Bertram H. Buxton, MD and Henry C. McDuff, MD summarizing in great detail the *56* cases of erythroblastosis fetalis encountered in the prior eight years at Providence Lying-In Hospital. After a review of the pathogenesis and therapies of this immune disorder, they note that carefully following the anti-Rh titer will show the time when the pregnancy should be interrupted.

John J. Wittmer, MD discusses the vexing problem of absenteeism in industry, particularly during a war-time when optimal production is necessary for national defense. "If this type of absenteeism could be eliminated," he observes, "it would mean the addition of two million workers to the industrial rolls; not two million trainees or physically handicapped workers, but two million skilled workers. This figure results from the simple arithmetic of dividing the more than 400,000,000 skilled man-days that have been lost each year by the number of working days each year." The author advocates better safety programs, serious health programs, and functioning labor-management programs.

The lead editorial discusses the recent availability of penicillin but expresses concern that this new agent [which can only be given parenterally] places an undue burden upon a critically reduced nursing staff. The editorial points out that prescription of penicillin requires better than ten injections per day per patient. The hope is expressed that penicillin may soon be given orally.

25 Years Ago (May 1970)

Honoring the 125th anniversary of Butler Hospital, the Journal pub lishes the proceedings of a seminar entitled "Mental Health Problems in the Urban Society" cosponsored by the American Psychiatric Association. Historical commentary is offered by J.J. Baker, MD and introductory remarks by A.A. DiPrete, M. Johnson, MD and Governor Frank Licht. L.J. Duhl, MD explores the urban environment and urban health as an intergral part of the total city ecology; B.J. Black, MD discusses the availability of mental health services within cities and which populations do or do not receive such services; M. Mitchell-Bateman, MD addresses the problem of the isolated citizen within large cities and his inability to benefit from conventional sources of urban mental health therapy; and A. Allen describes the plight of the Black urban dweller in seeking mental health services as a member of an ethnic group experiencing a greater measure of cultural chaos than others.

Stanley D. Simon, MD discusses the immense societal problems caused by drugs, drunken driving and the high cost of hospitalization.

A brief editorial explores the uncomfortable issue of whether life-sustaining therapies should be routinely administered to infants with hopelessly severe birth defects.

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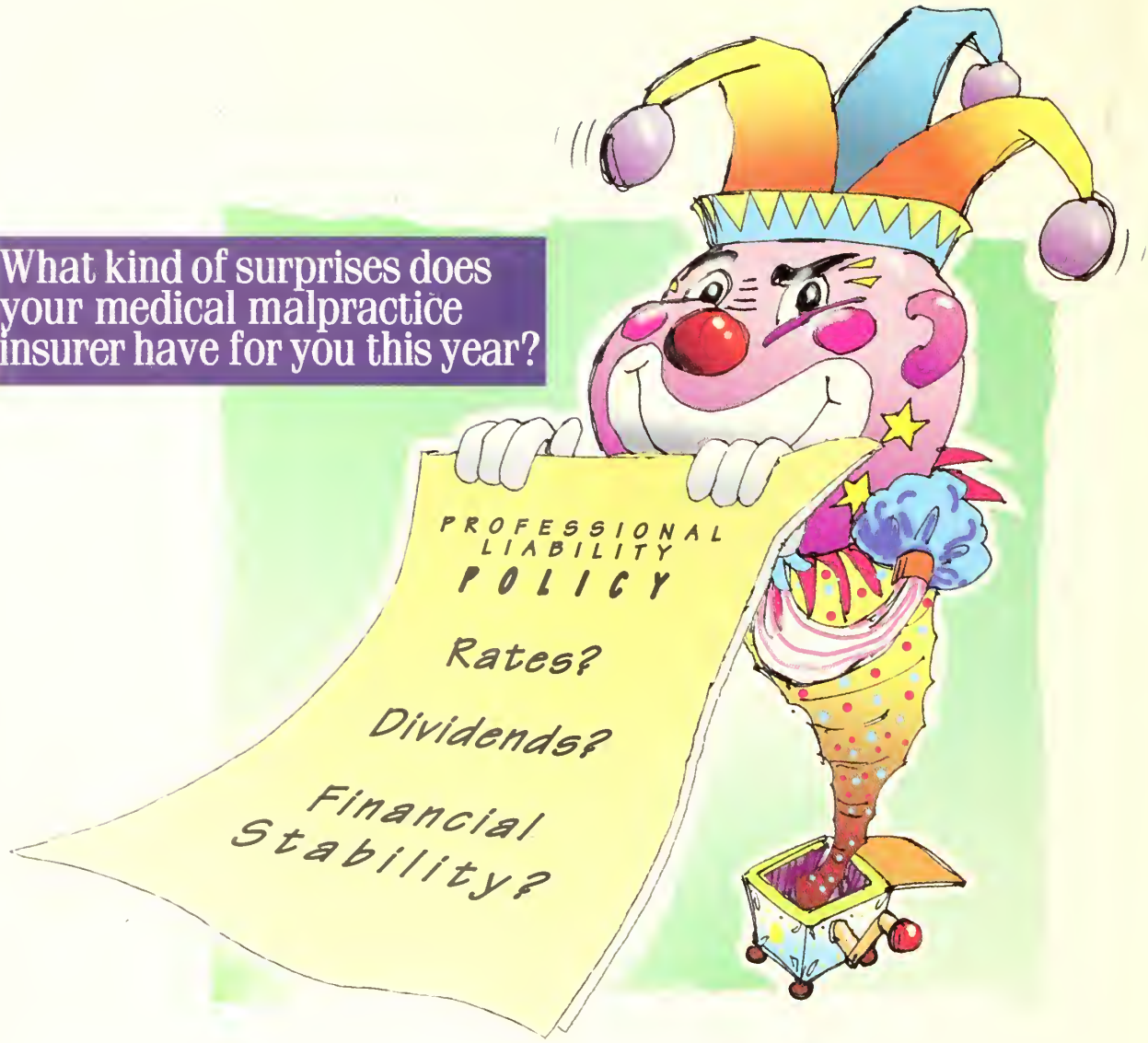

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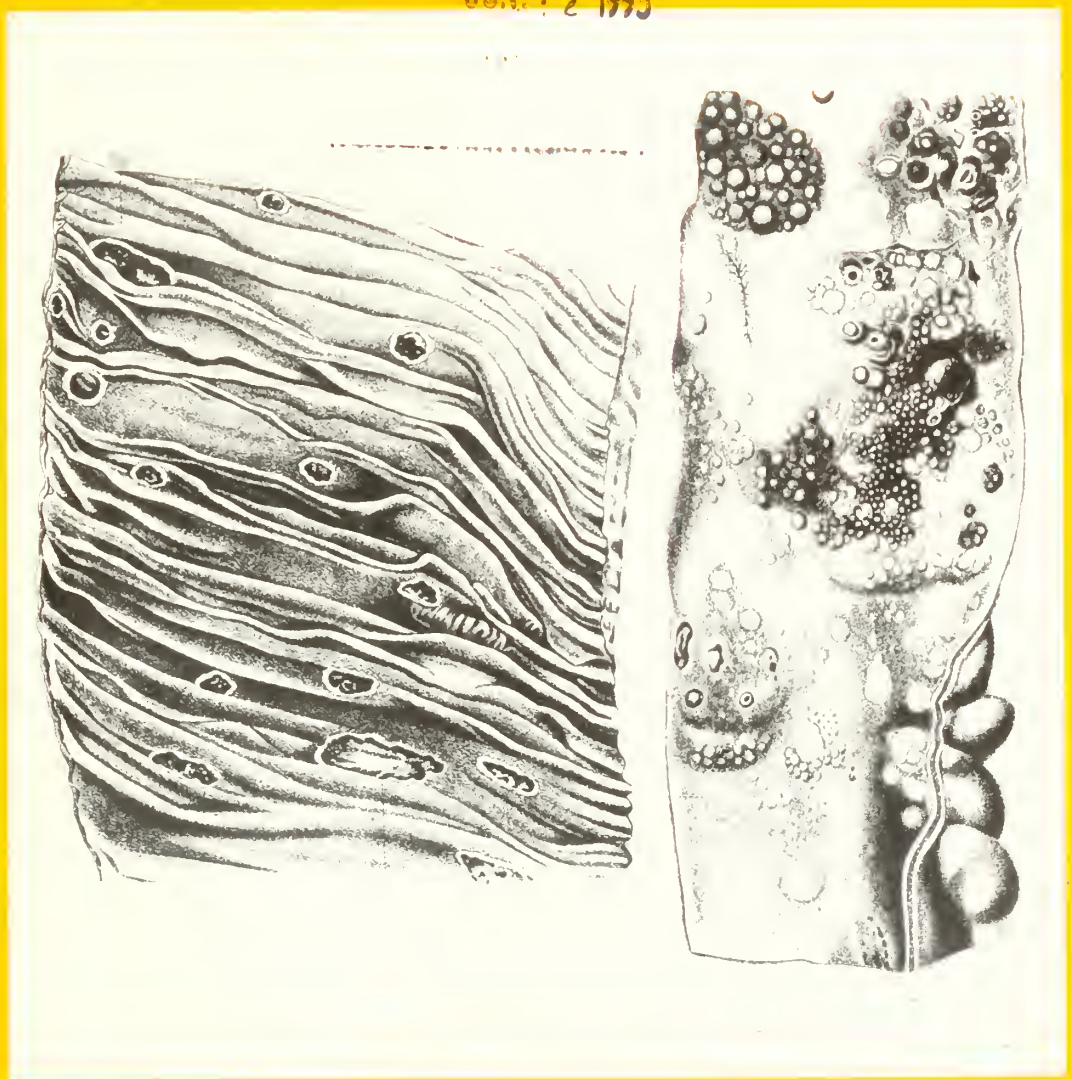

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Cover: Lithographs from the 1861 text (H. Lebert: *Traité d'Anatomie Pathologique*) illustrating various forms of chronic ulcerative colitis.

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COMMENTARIES

Colorectal Disease in the '90s

The diversity of disease associated with the large intestine is sufficient to command the attention of a wide spectrum of medical practitioners including pediatricians, primary care physicians, radiologist and pathologists—as well as gastroenterologists and surgeons. This issue of RHODE ISLAND MEDICINE contains manuscripts by local physicians describing various diagnostic and management considerations in some benign and malignant lesions of the colon and rectum.

We are currently the beneficiaries of numerous advances in genetics which may enable us, in the near future, to assess more accurately the probability of developing gastrointestinal cancer in the individual patient. For the present, however, we possess no reliable, simple blood test or diagnostic procedure that can detect or exclude large bowel cancer. This issue will explore the current status of screening techniques including the role of carcinoembryonic antigen, the place of sigmoidoscopy in asymptomatic patients, and the dilemma of cancer surveillance in persons with inflammatory bowel disease.

When a patient with advanced rectal cancer is seen, one is struck by the knowledge that a routine sigmoidoscopy 5 years earlier might have detected a small mucosal adenoma, and removal of that adenoma might then have avoided the later need for an abdominoperineal resection. A clear understanding now exists that colon cancer generally arises from precursor adenomatous polyps. In the elegant survey by Soderberg and his colleagues (published in this issue) only 9% of patients with rectal cancer were diagnosed by screening sigmoidoscopy. Clearly, in Rhode Island, there is an underutilization of screening sigmoidoscopy. Practicing physicians should be aware that both the American Cancer Society and the National Cancer Institute have endorsed routine, periodic sigmoidoscopy for asymptomatic patients 50 years or older.

As a counterpoint to the problems of detection and management of colorectal cancer, we have included a manuscript summarizing Wrobleski's extensive experience in the management of a common but frustrating anorectal disorder, hemorrhoids.

Steven Schechter, MD

The War on Drugs: An Alternative Approach

As a physician and parent, my perspective on the drug problem is uncomfortably different from the federal drug strategy; I believe we should focus on care rather than punishment. Over the years, I have developed this perspective as I have tried both in my professional and family life to discourage people I care about from engaging in risky behavior. I educate my patients about responsible choices, knowing at some point they may disregard my advice. I warn them about consequences of their decisions and prepare myself for any problems should they arise. I teach my children to have solid moral standards, in the hope that they will be decent citizens. I also warn them about risks, knowing that, despite my attempts, they may behave in a way that can harm themselves and others. I have learned that it is best to prepare people to make healthy decisions, but, also, to take action to insure that people receive the care they need should they make unhealthy ones.

It seems obvious, by now, that America can't order drug use to "go away;" but our current program, based on a "no availability, no use" logic, has refused to deal with this issue. We are left using unbelievable "try-and-die" prevention messages that do not stop young people from experimenting with drugs, but do convince them that we cannot be trusted to tell them the truth about the real risks and consequences of their behavior. Last year we arrested 310,000 for marijuana possession, almost a third of all drug arrests, in an attempt to scare people away from drugs. In spite of our efforts, according to the National Household Survey, marijuana use actually rose during 1994.

It is time for new policy approaches—ones that will allow us to hold our ground about the dangers of drug use, but at the same time allow us to address the needs of those who do experiment. A harm reduction approach gives us a straightforward way to achieve this end. Harm reduction focuses more on maintaining public health and safety, and providing care for addicts and users who need it. The approach provides these clear policy suggestions about how to reduce the damage associated with drugs: realistically educate people about the serious consequences of drug use, provide treatment on demand, and stop criminalizing people for engaging in behavior we cannot stop.

This policy shift would mark a significant but necessary change. We need to acknowledge that our nation's war on drugs has become a war on drug users. Statistics show that despite our supply side rhetoric, our policy concentrates on addressing drug demand. Most of our drug arrests are not of drug dealers, but users: more than 70% in 1993 were arrested for simple possession crimes. Furthermore, many of those arrested are addicts. Justice Department figures show that 4 in 10 women arrested have a serious substance abuse problem. The Drug Use Forecasting Network shows similar levels of drug use in the prison population; over the past 4 years 50% to 70% have had illegal drugs in their systems at the time of arrest.

We have to remember our priorities: our goal is to prevent or limit the problems of drug use, not criminalize drug users. Considering our concerns about crime and violence, we should be stopping violent offenses, instead of arresting people for drug possession. This change in police priorities would not necessarily make drug use skyrocket. In fact, we have evidence to the contrary. In the '70s, when a few states first decriminalized and then recriminalized marijuana, use levels stayed relatively constant. These states' histories show that it is a mistake to believe that the criminal law is the only barrier to drug use; a variety of informal social controls also discourages drug use and keeps consumption at relatively consistent levels.

As our current drug policies begin to threaten the states with economic ruin, many people are beginning to question our policy approach. We now spend $6.1 billion annually to house addicts in our prison population. A number of studies show that we could prevent more crime with harm reduction approaches. RAND researchers have found that for every dollar spent on treatment programs, one would have to spend $7 in domestic law enforcement, $10 in border interdiction, and $23 in international efforts to get

the same decrease in cocaine consumption. The state of California had similar findings, showing that for every dollar spent on drug treatment, the state bought $7 in savings, by preventing crime, lowering health care costs, and increasing worker productivity. Estimates show that the demand for treatment far exceeds the meager 600,000 treatment places we have available. It seems obvious that we need more treatment opportunities not fewer. But some people still want to cut the skeleton prevention and treatment programs we have in place and further explode the prison population with drug addicts.

For me, the saddest aspect of our current policy is its propensity to waste human potential. I look at people arrested for possession spending lengthy criminal sentences in jail, needlessly becoming part of a criminal culture. I look at the growing number of women, or more specifically mothers, who make up the prison statistics and realize that, in our attempt to lock up more and more users, we are compromising two generations: addicted or drug-using parents, and the children they leave behind. Some analysts predict that if our laws do not change more people will be in prison than out by the year 2053. Even if these estimates prove to be wrong, still, we will have created a drastically different society: one in which the rates of addiction and illegal drug use remain stable, but the percentage of people with prison records escalates.

As Americans reassess the economic costs of the drug war, I would ask them to consider the bigger question: can they afford to build a future based on our current drug policy? The 1995 federal proposals places over 60% of our money in supply-side funding. This distribution would do little to improve current conditions. If we are serious about the drug problem, we need to invest more in demand reduction, much more than the 50/50 split some people suggest. In fact, the bulk of the current $14.6 billion drug control budget should be redirected to prevention and treatment programs.

My attitude is informed by the doctor's tenet, *primum non nocere*: first, do no harm. I know the war on drugs violates this principle. Furthermore, as a citizen, I know America can do better, and I want to live in a country whose drug policy enables people rather than discards them. It has become abundantly clear that criminalizing the drug problem does not allow us to achieve drug control.

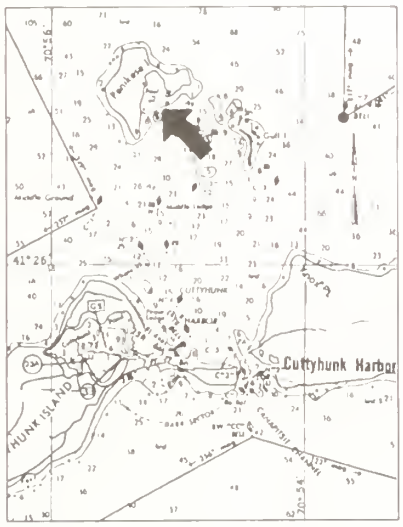
David C. Lewis, MD, Director, Brown University Center for Alcohol and Addiction Studies

(Based on a talk delivered at the annual meeting of the American Public Health Association, October 29, 1994)

Unclean, Unclean . . .

Coastal sailors—recreational or commercial—know of a drab, undistinguished bit of offshore granite rock situated southeast of Rhode Island, just beyond Cuttyhunk, called Penikese Island. Beginning in the 19th century this barren site housed the leper colony for all of New England. The facility was closed, finally, in 1921 and its remaining 13 inmates were transferred to the Carville leprosarium in Louisiana. The grim Penikese dormitories now house a school for delinquent boys.

At one time last century, active leprosaria were maintained in Florida, Louisiana, Texas, Minnesota, California as well as the New England waters. The largest of these, virtually indentured villages, are still in existence in Kalaupapa on the Hawaiian island of Molokai and in Carville, Louisiana. The closure of almost all of the leper colonies reflects three realities: First, that the number of new cases of leprosy has diminished progressively in the United States since the beginning of the current century, with fewer that 150 new cases in 1975. A transient rise in the next decade (see accompanying graph) was occasioned by numerous imported cases as large numbers of Southeast Asians sought refuge in this country. Second, that the communicability of leprosy had been vastly exaggerated. And third, that the enforced isolation of the leper represented an ill-informed and barbaric residue of prior centuries. Patients with leprosy are now readily admitted to our general hospitals in Rhode Island without fear that the disease will spread. Of course, this treatable disorder is now wisely called Hansen's disease, a name unblemished by older superstition—and a name unlikely to prompt panic.

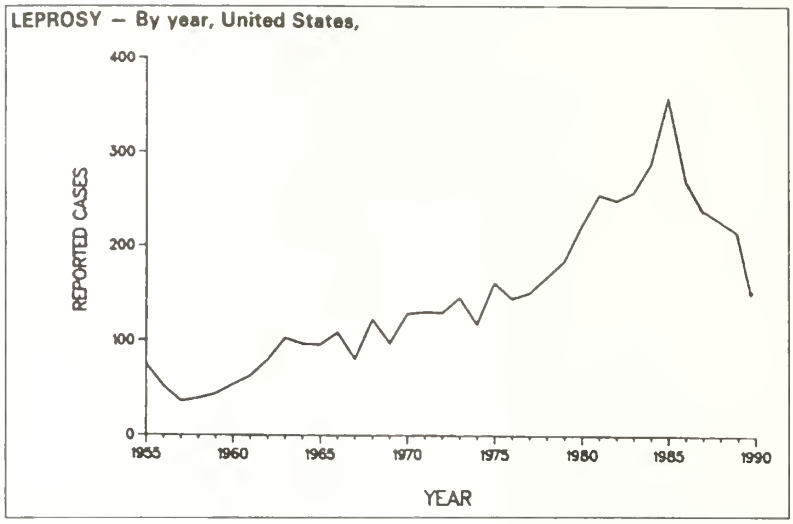


There are few diseases which carry the dread, the mythology, the social burden and the demonization that leprosy bears. In Leviticus, two chapters are devoted solely to its recognition and treatment. And once the pronouncement is made, ". . . the leper in whom the plague is, his clothes shall be rent, and he shall put a covering upon his upper lip and shall cry, Unclean, unclean. He shall dwell alone; without the camp shall his habitation be." Medical historians ask, however, whether the Hebrews, a nomadic people deeply concerned with hygiene, were not perhaps describing a broader range of chronic ailments with skin ulcerations, scalings and discolorations. When the Scriptures had been translated to Greek, the word *lepros*, meaning a scale or desquamation, was selected for these illnesses and it has persisted to this day.

In the New Testament, two unrelated persons, each named Lazarus, are mentioned. In John chapters 11 and 12, Lazarus of Bethany, brother to Mary and Martha, took sick and died. He lay in his grave for 4 days until Jesus came, and Lazarus then rose from the dead. Luke, chapter 16, speaks of yet another Lazarus in a parable concerning a beggar full of sores who dies at the gate of a wealthy man. The name, Lazarus, incidentally, had already undergone many changes since its original Hebrew form, Eliezar (meaning, helped by God); the name, in time, was abbreviated to La'zar, then to Lazar, and finally, with a Greek suffix, to Lazarus. It was the second Lazarus, the sorely afflicted beggar, who was to become symbolic of the wretched and reviled lepers of the world. And from his name has evolved a series of names for persons, places and organizations pertaining to leprosy. Lepers were called lazars; leprosy sanctuaries were called lazarets or, in Italian, *lazarettos*; a religious-military order of knights formed in Jerusalem during the crusades was called the order of St Lazarus, its objective to provide shelter for lepers. For centuries it supervised lazar-houses, particularly in France, until 1830. Somehow, the tales of the two scriptural Lazaruses had merged and the patron saint of this order was not the Lazarus with the loathsome sores but the Lazarus raised from the dead. The Lazarites, a missionary order founded in 1632 by St Vincent de Paul, on the other hand, bore that name only because their first home in Paris had been the abandoned priory of St Lazarus.

It is said that leprosy represented the dominant disease of the early middle ages; but whether these many outcasts suffered from a chronic infection of *M. leprae* or perhaps from one of a host of other chronic, deforming disorders is most debatable. Facial cancer, lupus, pellagra, scabies foeda, scrofula and morphea (a form of scleroderma) might easily have simulated leprosy. The descriptions rendered in the 13th century, while bearing a modest resemblance to Hansen's disease, are nonetheless lacking in anything pathognomonic: *the eyebrows fall bare, and get knotted with uneven tuberosities; the nose and other features become thick, coarse* and *lumpy, the face loses its*

mobility or play of expression, the raucous voice, the loss of sensibility in the hands, and the foul-smelling sores... (*De Lepra,* Gilbertus Anglicus, about 1307). In the next century, four cardinal signs of leprosy were widely adopted by clerics seeking out the leper: *alopecia, tinea, leonina* and *elephantia.* Many names, in addition to leprosy, were used: *mesel, Lepra Arabum*, and *Elephantiasis Graecorum.*



The status of lepers in the 13th century was most anomalous. On the one hand they were consigned by a higher authority to be bearers of a profane, loathsome disease, forbidden to live in any city, enter into any commerce or commune with mankind; also, they were denied the right of church attendance or even burial within a consecrated churchyard; they were not allowed to inherit, nor even to bequeath since their estates, if any, had instantly reverted to the state upon the establishment of their diagnosis. English civil law after 1270 gave local jurisdictions the right of expulsion if, in their judgment, leprosy became a manifest peril to the community. On the other hand, lepers were declared the blessed outcasts, *pauperes Christi,* the wards of nobility, given shelter without fee in special structures (lazarcotes, lazar-houses; England had almost 200 of them in the 14th century), permitted to beg in certain restricted zones and allowed to observe the altar through specially constructed narrow openings in the outer transept walls of cathedrals (openings called leper's windows or hagioscopes).

The lazar house of medieval England—sometimes called *Domus Dei* (House of God)—was a rude structure situated at the margins of most every city, often near healing mineral springs. The corruption of the flesh was already assumed and the avowed purpose of these sanctuaries, therefore, became ecclesiastic rather than therapeutic, serving to achieve the salvation of the soul rather than the body. Many leper hospices bore the name of St Giles, the 6th century Athenian who founded a retreat for the poor in Arles and who then became the patron saint of the crippled, the beggar and the leper.

The 14th century leper—or at least those so labeled—wore a characteristic grey cowled robe and carried a beggar's bowl as well as a wooden clapper, or bell, to announce his presence. By ordinance, the lepers were permitted two occupations: to beg, but only in certain restricted lanes; and to bury the bodies of executed criminals in unhallowed graves. The great famines and pestilences of the terrible 14th century reduced many non-lepers to begging; and for perhaps the only time in the disquieting history of leprosy, many homeless, untouched by leprosy, sought voluntary asylum in lazar houses donning the despised leper cloak so that they too might receive alms. The faces of allegedly leprous beggars were examined for lack of eyebrow hair and for the characteristic vitiliginous, parchment-white patches. Severe penalties were then meted out to the faux lepers. During this time of unrest the distinction between pilgrim, beggar, leper, knave and vagrant grew increasingly blurred.

Leprosy remains the sole disease for which society demanded permanent quarantine, in essence, life imprisonment. What was so special about leprosy to warrant this excessive reaction? Certainly its communicability was minimal; and, since the 15th century, its prevalence, at least in Europe, has been quite low. Yet, unattended, this disease turns into an incurable, disfiguring and disabling infirmity lingering for decades in the squeamish sight of others. Furthermore, leprosy, alone amongst diseases, bears a scriptural stigma calling for its utter isolation.

In the 13th century, the patriarch Job was said to be leprous; in the 14th century, he was thought to have had bubonic plague; in the 16th century he was declared to have been afflicted with venereal lues; and now in the 20th century, he is said to have staphylococcal boils associated perhaps with an immune deficiency. Truly, through the centuries, the affliction of Job furnishes a mirror that reflects the medical anxieties uppermost in each age.

The great bubonic plague of the mid-14th century depopulated Europe, but to an even greater degree it killed off the enfeebled, malnourished population of lepers. By the 15th century leper houses were increasingly vacant, and many of these shelters were then converted to other communal uses. By the 19th century leprosy in Europe shrank to a distant but repugnant memory except in residual pockets of disease in the Scandinavian countries, Scotland and southwest England. And by the 20th century, leprosy's center of gravity had shifted almost entirely to Asia and sub-Saharan Africa where the great majority of today's 11 million lepers may now be found. Nonetheless, in 1903, leprosy was one of only seven medical conditions which categorically excluded an immigrant from entering the United States. Little in this nation now remains of leprosy's affright except a sparse scattering of patients, an ingrained mythology—and a barren island off the RI coast.

Stanley M. Aronson, MD

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A Physician Is a Physician Is a Physician . . .

Pittsburgh, 1874: A girl child was born to the Steins on the snowy night of Feb. 3. The infant was the seventh, and final, offspring of this established, middle class family; they named her Gertrude.

From infancy she was coddled, given both educational advantage and latitude to create her own daily schedule. Her closest companion, well into maturity, was her older brother, Leo; they played together, talked incessantly with each other, and later in life traveled widely, sharing confidences, residences and esthetic interests. When Gertrude was 3, business took the family to forbidding Vienna. Her tutor, a young Hungarian student studying medicine at the university, initiated her into the mysteries of insect life and field botany. A few years later the family moved to Paris where again Gertrude's education was placed in the hands of personal tutors. Her interests were now largely literary, but descriptive botany, zoology and geology continued to be important pursuits that she shared with Leo.

The family then returned to the United States, establishing themselves in California. Oakland, in the late 19th century, was sufficiently rural to allow Gertrude and Leo to continue their exploratory field trips. Gertrude's existence at age 10 remained largely a life of her own devising. Her voracious readings now embraced Darwin, Agassiz and Huxley—all three scientists, in the year 1884, still quite alive and controversial. Gertrude confronted the theory of evolution re-

garding it as a pivotal revelation, ". . . exciting as the discovery of America." This was also the shadowed year during which her mother died. Seven years later, her father died leaving Michael, the oldest son, in charge of the family. Leo departed for Harvard to be an undergraduate student while Gertrude was sent to Baltimore to live with the Bachrachs, another branch of this mercantile family. Two years later, Gertrude entered Radcliffe College, partly because Leo was in Cambridge and partly because of the outstanding faculty Radcliffe shared with Harvard. During the succeeding 4 years her teachers included George Santayana, Josiah Royce, William Moody, and William James, the professor who exerted such a profound influence both upon her thinking and her career.

A Radcliffe classmate describes Gertrude: "She was a heavy-set, ungainly young woman, very mannish in her appearance. Her hair was cut short. . . and she always wore black." A professor of biology, Hugo Munsterberg, introduced Gertrude to the discipline of experimental psychology; together they wrote a paper entitled, "Normal Motor Automatism" (*Psychological Review,* Sept. 1894). Further research efforts culminated in papers on the place of repetition in memory, automatic writing, and factors causing variations in attention. Some of Stein's published observations were later quoted—and endorsed—by B.F. Skinner.

When her undergraduate days came to a close, Gertrude sought Professor James' counsel about her future. He advised that she consider a career in theoretical psychology but urged, as a prelude, that she first obtain an MD degree. A summer intervened; rather than attend to her deficiencies in Latin, Gertrude elected instead to vacation with Leo in the Low Countries, followed by an extended stay in Paris punctuated by a leisurely voyage down the Rhine. Only at the last moment did she apply herself single-mindedly to the elements of Latin and thus managed to pass the admission examinations at a newly established institution in her hometown of Baltimore, the Johns Hopkins medical school.

The first 2 years of medical school progressed smoothly. Her grades were excellent and her original studies on the myelinated tracts of the nervous system came to the personal attention of both William Osler and William Halstead (two of the four original Hopkins faculty, the other two being Welch and Kelly). The intervening summer vacations were again spent in Europe, with Leo, touring the art centers of northern Italy. Her third medical school year, devoted now to clinical exercises, yielded fewer episodes of intellectual excitement. Her sole memorable experience arose when she was assigned to the impoverished African-American district of Baltimore where she delivered nine apparently normal babies. During her final year of medical school, Gertrude's grades were barely passing and she rapidly lost interest in her studies, often neglecting classes. From the most promising student in her class, she sank to one whose professional future was in doubt. Her professor of obstetrics declined to give her a passing grade and her performances in otolaryngology, dermatology and ophthalmology were deemed marginal. She was nevertheless offered the MD degree if she would enroll in some remedial electives during the summer following her senior year. Gertrude immediately declined this option—and went so far as to express gratitude to the professor of obstetrics for blocking her graduation. She promptly took off for Perugia, Italy, joining Leo on a tour of Tuscany centers of art. Her cavalier rejection of the faculty compromise occurred at a time when few women were entering the mainstream of medicine, and each loss of a female candidate-physician was a source of distress to those who had fought for equal gender representation in the learned professions. In many ways, Hopkins was a unique medical school. Its chief financial supporters were four widowed women who provided abundant funding to the school—but only if no restrictive quotas for women were established.

Except for annual visits to the United States, Gertrude Stein remained an expatriate in Europe, living for over 50 years at 27, Rue de Fleuris, in the Montparnasse district of Paris. "America is my country," she declared, "and Paris is my home town. And so I am an American and have lived half my life in Paris, not the half that made me but the half in which I made what I made." During this half century she amassed one of the great collections of impressionistic art. She had been an intimate friend of Picasso, Matisse and numerous other artists. Her salon evolved into the unofficial cultural embassy of France. She aided young writers from Hemingway to Joyce in their artistic struggles. Stein's personal writings—confrontational, controversial, disjointed, provocatively awkward, even primitive, at times almost dyslexic—had features in common with the graphic works of her intimate friend, Picasso. She rejected the mechanically contrived, linear, formal writing style of others, eschewing particularly any traces of elegance or felicitous phraseology; she believed that such writing was as esthetically unchallenging as the waiting room of a funeral parlor. In attempting to write creatively, she declared, "You are so afraid of losing your moral sense that you are not willing to take it through anything more dangerous than a mud puddle." When translating thought to the written word, she believed, fear should never be a deterrent: "Anything scares me, anything scares anyone but really after all considering how dangerous everything is nothing is really frightening."

Stein devised a novel form of written expression, uncluttered by irony, sentimentality—or punctuation; her prose voice was forthrightly unscientific. Science, to her, was a comfortable, rational realm where the future arose only from the elements of the present, which in turn was child to the past. Everything, then, had identifiable precursors; and everything sooner or later resulted in something else. Stein's world, on the other hand, with its simple vocabulary and permissive grammar, was an eternal present, shimmering with insight, but not necessarily going anywhere. Reading Stein provides few epiphanies; rather, one says: "Yeah . . . I knew that!" Her writings showed few traces of her 4 years of rigorous medical education.

Medicine, preeminent amongst the learned professions, loses few of its members to other vocations or callings. Once graduated, scarcely any physicians relinquish their professional station except through severe illness or disability. Some, now and then, do wander afield, but largely through disillusionment or distaste with the graceless features of human frailty. A very small number—such as Keats, Maugham and Stein—were never fully or truly invested in medicine and when the opportunity arose, they had resolutely fled from it abandoning diploma, license and acquired skills. It is doubtful whether medicine provided anything to these gifted writers other than an interval to think and a brief but intense intimacy with birth, death and the straits in between. Other writers—such as A.J. Cronin and A. Conan-Doyle—had meandered hesitantly from medicine, never utterly forsaking it completely nor giving up its cherished symbols.

So much time, energy, even money, is invested in medical studies that continuity in the profession sometimes reflects more a fear of embarrassment than an inner conviction. It probably requires immense courage, then, to relinquish medicine solely by reason of incompatibility or worse, boredom. Neither in her public writings nor in her private diaries did Gertrude Stein ever express remorse over the 4 years she had devoted to medical education; nor, however, did she ever regret her decision to leave medicine. She had, in truth, so many other things to do. "It takes a lot of time to be a genius," she once reflected, "you have to sit around so much doing nothing really doing nothing."

Stanley M. Aronson, MD

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Colon Cancer Screening: The Case for Sigmoidoscopy

Edward Feller, MD

Colon cancer, most common in the distal bowel, has a long, detectable pre-malignant phase during which a simple intervention (polypectomy) can eliminate the possibility of malignancy developing in the future.

Methodologic issues cloud the utility of various recommendations to screen for colorectal cancer. Recent studies and technologic advances have clarified some of the uncertainty concerning periodic sigmoidoscopy as an appropriate way to detect and remove precursor lesions and early, curable malignancies. However, no controlled trials exist comparing screened and unscreened populations in preventing death from colon cancer.

Rationale for Screening Sigmoidoscopy

In 1990, approximately 150,000 new cases and 60,000 deaths from colorectal cancer occurred in the United States.1 National organizations, including the National Cancer Institute and the American Cancer Society, recommend screening starting at age 50 with periodic fecal occult blood testing and sigmoidoscopy. The rationale for screening is strong evidence that large bowel cancer develops from a slow progression of normal mucosa into an adenomatous polyp, with subsequent malignant degeneration of some initially benign lesions; thus, screening, if effective, would be able to remove both pre-malignant lesions as well as early, curable cancer. The majority of colon cancers occur within the reach of the 60 cm flexible sigmoidoscope. Direct visualization of lesions permits detection of neoplasia at a very early stage.2

Early, Uncontrolled Studies of Sigmoidoscopy

In the first large study in 1960, Hertz et al. screened 26,000 patients with rigid sigmoidoscopy;[3] 58 cancers were detected (0.22%), of which 81% were Dukes A or B. Follow-up was limited to cases with a diagnosed index cancer and no control group was studied. Subsequent studies have confirmed that detection of early, curable cancers is rare. The major benefit of sigmoidoscopy screening is likely to be in identifying and removing adenomatous polyps to prevent the development of invasive malignancy. In 1978 Gilbertsen and Nelms reported rigid sigmoidoscopy results on more than 18,000 asymptomatic patients who had removal of all detected polyps.[4] Study participants had an 85% decrease in the expected rate of subsequent recto-sigmoid cancer. This data, though widely quoted and accepted as the cornerstone of the justification for sigmoidoscopy screening, has been criticized because some symptomatic patients were "screened" and no control group was followed.[5]

Recent Studies

The most powerful support for sigmoidoscopy as part of a comprehensive screening program comes from a recently reported case-control study. Selby and co-workers compared the incidence of rigid sigmoidoscopy screening in 261 patients who died of recto-sigmoid cancer to that of 868 age- and sex-matched controls.[6] Among the patients who died of colon cancer, 8.8% had undergone sigmoidoscopy in the preceding 10 years compared to controls, of whom 24.2% had prior sigmoidoscopy. Individuals who had one or more sigmoidoscopies in the preceding decade had a 70% decreased risk of fatal distal cancer. This reduction was limited to the area examined by the rigid sigmoidoscope. No difference was found in the incidence of fatal cancer in the proximal colon. The specificity of the negative association for malignancy exclusively within the area examined supports a legitimate benefit from screening rather than confounding due to selection bias. These results provide strong incentive for screening, although the study design and small sample size made determination of optimal interval for surveillance impossible to assess.

A second major study supporting the benefit of sigmoidoscopy was reported by Atkin and co-workers who reviewed records of 1,618 individuals who had recto-sigmoid adenomas removed after discovery by rigid sigmoidoscopy and did not have subsequent colonoscopy.[7] Risk of large bowel malignancy, in an average follow-up of 13.8 years, was greatest in patients whose polyps were inadequately removed, had villous or tubulo-villous structure, or were multiple or large (>10 mm in diameter). Among the 776 patients with only small, tubular adenomas, colon cancer developed in but 4 patients. No control group was studied: thus, the magnitude of any effect is impossible to determine. Since large polyps, perforce, arise from small polyps, this finding is controversial and requires confirmation. These results suggest, however, that surveillance with colonoscopy can be less intensive in individuals with only small tubular adenomas at sigmoidoscopy. Because surveillance colonoscopy is a prime factor in the cost of screening, the ability to stratify patients into different magnitudes of risk based on the size and nature of polyps found would be a pertinent advantage.[8,9]

The Case for Sigmoidoscopy

Introduction of flexible fiberoptic sigmoidoscopies in the 1970s with a length of 60-65 cm resulted in improved patient tolerance and compliance as well as an increased diagnostic yield using the longer instrument. Two to three times more neoplastic lesions can be visualized with the longer instrument than with the rigid 25 cm sigmoidoscope. The procedure is safe, requiring no anesthesia. Representative results from several studies of this newer technology in asymptomatic patients indicate that mass screening will detect adenomatous polyps in 8% to 10% and cancer in 0.2% to 0.5% of individuals Despite recommendations from national societies and evidence supporting its effectiveness, sigmoidoscopy screening is performed in fewer than 10% of eligible patients in the United States.

In the "average-risk" patient (no family history of bowel cancer, no symptoms or signs of colon disease, no underlying disease associated with increased risk), a sigmoidoscopic examination without finding an adenomatous polyp is associated with a low risk of more proximal neoplasia; however, the false negative rate of this test is unknown. Some tumors are missed, particularly flat lesions. Rarely, malignancy arises *de novo* or in diminuitive adenomas. In the study of Selby et al.[7] cancers arose during the follow-up period in areas of the large bowel judged to have been examined and deemed free of neoplasia.[6] These malignancies were either present at sigmoido-

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scopy and not visualized or developed subsequent to the examination 1 to 3 years previously.

Is screening sigmoidoscopy appropriate in "average risk" patients based exclusively on age? Recent data strongly supports this practice. Colon cancer, most common in the distal bowel, has a long, detectable premalignant phase during which a simple intervention (polypectomy) can eliminate the possibility of malignancy developing in the future.[10]

Unanswered questions and incomplete data continue to exist. Ransohoff has outlined salient areas for further investigation:[9]

- Who needs screening?
- How frequently?
- What length of bowel needs to be examined?
- What constitutes appropriate, adequate surveillance? For normal adult populations? For high-risk populations?
- What is the natural history and approach to very small adenomas?
- Who should do the screening procedures?
- How are cost-benefit issues to be addressed and resolved?

Optimal screening criteria to detect colorectal cancer remain unresolved. Newer techniques, including immunochemical methods to detect occult blood in feces and the application of newer molecular biologic procedures may, in the future, offer simpler and better means of identifying this common neoplasm at a yet earlier stage in its evolution.

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Inflammatory Bowel Disease and Its Association with Colorectal Cancer

Steven Schechter, MD

Patients with inflammatory bowel disease are at an increased risk of developing intestinal malignancy.

This review will discuss the inflammatory bowel disease (IBD) patients' risk of developing intestinal carcinoma over time. Much of the older literature suggesting ulcerative colitis (UC) as a possible precursor to colorectal carcinoma (CRC)[1] has recently been challenged.[2] In contrast, newer articles have cited Crohn's disease (CD) as having increased importance as a risk factor for intestinal malignancy.[3]

Understanding the relative risks for malignancy in both UC and CD will enable physicians to better advise their IBD patients on CRC screening and surveillance. A distinct element of clinical overlap between UC and CD exists especially with colonic involvement. This so-called indeterminate colitis poses special management problems, especially if an ileal-pouch anal anastomosis is contemplated. With this in mind, there are still sufficient differences between UC and CD, that their respective risks for malignancy must be discussed separately.

Ulcerative Colitis

Patients with chronic UC have an increased risk of developing CRC. Initial observations from tertiary care centers documented that over 25% of UC patients, with disease duration greater than 25 years, will develop CRC. More recently, however, several studies have found the incidence to be significantly lower. Gilat et al[4] reported on the development of CRC in a population-based study involving 1,035 patients with UC. The cumulative incidence of CRC was 0.2% at 10 years, 2.8% at 15 years, 5.5% at 20 years, and 13.5% at 30 years. These data suggest that CRC risk in chronic UC may have been overestimated. Population-based studies can more accurately define the true incidence of CRC in chronic UC. Studies from tertiary care centers may be more affected by regional referral patterns and may over-represent worst case scenarios.

Important determinants of this malignant potential are: duration of disease, extent of disease, and age of onset. Usually, patients have greater than 8 to 10 years of disease before CRC poses a threat. Pancolitis, or more specifically, disease extending proximally to the splenic flexure imparts a higher risk of CRC than left-sided disease alone (ie, proctosigmoiditis). Early age of onset was thought to be related to an increased risk of CRC. Gilat et al[4] and Lashner,[5] however, reported just the opposite. Increasing age of symptom onset, although not intuitive, was a more ominous risk factor.

Our inadequate understanding of malignant degeneration in UC parallels our ignorance of the etiology of UC. Most researchers feel that repeat episodes of chronic inflammation and subsequent mucosal epithelial repair set the stage for dysplasia-adenomatous nonpolypoid change in the mucosal epithelium. Twenty-five years ago, Morson and Pang[6] identified mucosal dysplasia as a strong risk factor for CRC. Riddell et al[7] introduced the terms "low grade dysplasia" (LGD) and "high grade dysplasia" (HGD) in an attempt to classify these mucosal changes. As the grade of dysplasia increases, so does the risk of developing carcinoma. The clinical implications of LGD and HGD with respect to CRC surveillance will be discussed later. Nutritional factors such as folate deficiency have been associated with colonic neoplasia.[8] Genetic studies have also shown differences between sporadic and UC-associated CRC.[9] The *c-KI-ras* (a proto-oncogene) mutation is higher in sporadic CRC.

Initial observations from tertiary care centers documented that over 25% of ulcerative colitis patients, with disease duration greater than 25 years, will develop colorectal cancer.

The usual chain of events in developing sporadic CRC starts with the formation of an adenomatous polyp. Over a period of time (at least 5 years) this polyp may degenerate into a carcinoma invading into the submucosa of the polyp. This is termed the polyp-cancer sequence. In UC, this sequence is modified since, as a rule, adenomatous polyps are absent. Inflammatory polyps are frequent in UC but have no neoplastic potential. Dysplasia, a precursor to CRC, develops *de novo* and can be found on routine colonoscopic biopsies in chronic UC. Often CRC in UC can be flat, ulcerated, and multicentric rather than exophytic, polypoid and unifocal as in cancer in non-colitis cases. Colonic strictures should always be regarded as malignant until proven otherwise since these carcinomas may take a linitis plastica form; to rely solely on mucosal biopsies in this type of lesion can be misleading and costly. Aggressive surgical management with resection is warranted even if malignancy can not be found on biopsy. One should be very skeptical about a rectal stricture in a patient with chronic UC and therefore should not pursue dilatation as definitive management. After adjustments for Duke's classification, these carcinomas do not carry a poorer prognosis than the sporadic type.[10]

An appropriate cancer screening program for patients with chronic UC is vital (Table 1). Using extent and duration of illness as a guide leaves some unresolved issues. For example, how often do we screen patients with colonoscopy, and what is our endpoint or goal?

Our goal must be to identify a population at high risk for carcinoma who would benefit from proctocolectomy with ileostomy or ileal pouch-anal anastomosis. Colonoscopic screening allows for pancolonic mucosal biopsies which can then be examined for LGD, HGD and/or malignancy. Scheduling of colonoscopy in UC patients must relate to its cost effectiveness and ability to detect a premalignant condition. A recent study from the University of Chicago Medical Center addressed this issue. Lashner et al[5] found that as more screening tests are done, the delay between development of dysplasia and the diagnosis of carcinoma is shortened while the cost increased. These workers defined the "lead time" as the time between the detection of LGD and

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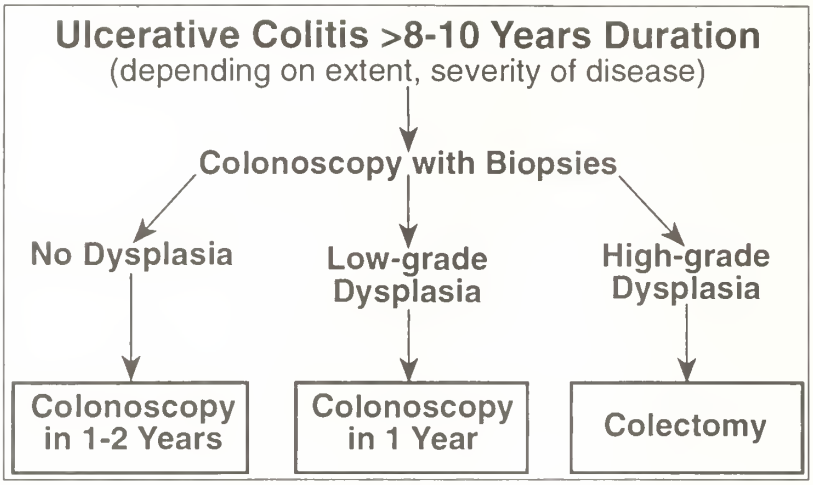
ABBREVIATIONS USED:
CD: Crohn's disease
CRC: Colorectal carcinoma
HGD: High grade dysplasia
IBD: Inflammatory bowel disease
LGD: Low grade dysplasia
UC: Ulcerative colitis

the development of HGD/carcinoma. The "lead time" (delay in developing cancer) was found to be 3 years, allowing for an effective screening program. Approximately 40% of patients with HGD have a focus of carcinoma in the resected specimen. The hazard rate is defined as the probability that a patient may develop HGD/carcinoma within 1 year. Clearly the hazard rate increases over time in chronic UC. This is why Lashner et al[5] claim that uniform screening is erroneous. Their model screening program starts after 8 to 10 years of documented UC with 3-year intervals (the lead time), and shortens over time as the hazard rate increases. Patients would undergo colonoscopy every 3 years for the first 12 years, every 2 years for 6 years, yearly for 14 years, and every 6 months beyond. Such a program requires more than 30 colon-oscopies in a patient's lifetime. As the duration of UC approaches 40 years, the hazard rates are high enough to consider prophylactic proctocolectomy or ileal pouch-anal anastomosis. The presence of LGD on at least two separate colonoscopic procedures over time may also be a reasonable indication for elective surgery. The prohibitive risk of carcinoma makes HGD an absolute indication for surgery. However, in a recent prospective study carried out between 1977 and 1991 involving 131 patients with UC, Jonsson et al[12] felt that CRC surveillance programs were resource consuming and the cost-benefit ratio questionable. The ideal CRC surveillance program in chronic UC is still not clear and only large and thorough prospective studies can shed light on this dilemma.



The ideal colorectal cancer surveillance program in ulcerative colitis is still not clear and only large and thorough prospective studies can shed light on this dilemma.

Crohn's Disease

Crohn's disease is associated with malignancy to a lesser extent than in UC. Greenstein et al[13] retrospectively evaluated 579 patients with CD and 267 patients with UC at the Mount Sinai Hospital, NY between 1960 and 1976. The incidence of gastrointestinal malignancy was 2.9% and 9.7% respectively. Interestingly, 40% of the intestinal malignancies found in CD occurred in surgically bypassed segments of intestine left *in situ*.

Small bowel adenocarcinoma arising in CD appears to differ from sporadic adenocarcinoma. In 1984, Collier et al[14] reported 3 cases and reviewed 75 other previously published cases. More than 90% of the CD-associated cancers were diagnosed postoperatively. These carcinomas occurred at a young age (mean 47 years), were located in the distal small bowel and arose predominately in the diseased segment. Although 28% had previous intestinal bypass, the authors did not feel this procedure was a risk factor. Others feel that patients with bypassed segments greater than 30 years represent a subset of patients in whom the risk for cancer is high. The long duration of the unresected diseased segment *in situ* may place the patient at risk, not the bypass procedure.[15] Unfortunately, the overall prognosis for small bowel adenocarcinoma remains poor with a 2-year disease-free interval of 9%.

The association of Crohn's colitis with large bowel malignancy is controversial. Several studies have found no relationship[16] while others indicate an increased risk. In one study in Uppsala, Sweden, a cohort of 1,655 patients with CD was followed for development of CRC. The overall risk ratio was 2.5 (representing 12 cancers). The more distal the CD in location, the greater the likelihood of developing CRC. When the CD was confined to the colon, the risk ratio increased to 5.6. Early age onset was also a risk factor. The highest risk ratio was 21, found in patients with CD diagnosed before age 30 with colonic involvement. Gillen et al[17] compared the risk of developing CRC in 125 patients with extensive Crohn's colitis and 486 patients with UC. An 18-fold risk increase was found in the former and a 19-fold increase in the latter. Some investigators have suggested setting up protocols for colonoscopic surveillance as in UC.[18] Connell et al[19] reported a higher than expected number of lower rectal and anal carcinomas in a retrospective review of several thousand patients with CD at a single institution (such an analysis may be distorted by a referral bias). The authors speculated that this finding was related to chronic, complicated anorectal disease.

. . . 40% of the intestinal malignancies found in Crohn's disease occurred in surgically bypassed segments of intestine left in situ.

Hamilton[20] reported 50% of CD patients with CRC showed mucinous changes histologically. In contrast, only 10% of sporadic

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colon carcinoma are mucinous. Kyle and Ewen[21] at the University of Aberdeen identified 1,008 CD patients from the northern part of Britain over a 34-year period. In their study, 4 of 14 carcinomas were mucinous.

The pathologic process of CD often hampers early detection of carcinoma (Table 2). For example, endoscopists might find it difficult to intubate the ileum. Strictures and bypass segments are hard to negotiate let alone biopsy.[22] All too often rectal stumps are ignored. It will be interesting to follow the incidence of intestinal carcinoma in patients undergoing strictureplasties for CD-related small bowel strictures as an alternative to resection. Strictureplasties are surgical procedures that conserve small bowel by allowing the surgeon to correct strictures in CD without resection.

Table 2.—Problems in Diagnosing Cancer in Inflammatory Bowel Disease

1. Complications (eg, bleeding, pain, bowel complaint) frequently mimic the underlying disease.
2. In colitis, cancers are typically flat and infiltrative, not exophytic and polypoid.
3. Endoscopic intubation of the terminal ileum is difficult.
4. Strictures, bypassed segments of bowel and rectal stumps are frequently not examined.

Conclusion

Patients with IBD are at an increased risk of developing intestinal malignancy. Chronic UC has been implicated historically as a highly pre-malignant condition. More recently, however, this view has been challenged. A cost -effective colonoscopic surveillance program has yet to be developed. CD is gaining more attention recently as having a malignant potential especially when the large intestine is involved. As more light is shed on IBD, the clinician inevitably will develop better skills and techniques in the early detection of intestinal malignancy complicating these common diseases..

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CEA: Is It of Value in Colorectal Cancer?

R. James Koness, MD

. . . fetal antigen (CEA) is present in fetal gut tissue as well as tumors from the gastrointestinal tract, but not in benign tumors or in normal adult tissue.

Tumor markers are measurable circulating factors in biological fluids of patients with cancer and may serve as indicators of underlying disease. In 1965 Gold and Freedman demonstrated that fetal antigen (carcinoembryonic antigen, CEA) was present in fetal gut tissue as well as tumors from the gastrointestinal tract, but not in benign tumors or in normal adult tissue.[1] Subsequently, this antigen was detected in the circulation of patients with gastrointestinal cancer, but not in patients with non-malignant conditions. Radioimmunoassay, enzyme-linked immunoassay, and other immunologic assays are now available to detect minute amounts of antigen. Tumor markers, however, have not been as helpful as anticipated initially; their utility remains controversial. In this review, we will examine the controversies, applicability, and myths about carcinoembryonic antigen.

Structure and Normal Values

CEA is a complex glycoprotein with a single polypeptide chain and varying carbohydrate components. Its molecular weight is approximately 180 kd (kilodaltons), and the polypeptide chain accounts for the major antigenic expression. CEA, as a surface immunoglobulin, may participate in intercellular recognition and attachment, and thus may promote metastasis by binding to CEA or CEA receptors at sites of metastasis. If CEA binds to itself, then CEA on colorectal cancer cells traversing the hepatic or pulmonary microcirculation may bind to CEA located on receptors in the liver or lung itself. Alternatively, the CEA may bind directly to receptors on Kupffer cells or alveolar macrophages.

In normal individuals, the plasma concentration of CEA is less than 2.5 ng/ml, and the values seen in smokers is usually no higher than 5 ng/ml. The liver is the primary site of metabolism of CEA, with decreased clearance observed in patients with abnormal hepatic function, particularly dysfunction caused by biliary obstruction. Benign conditions may also cause an elevated plasma CEA level, including chronic obstructive pulmonary disease, gastritis, pancreatitis, diverticulitis, inflammatory bowel disease, benign prostatic hypertrophy, and renal disease. It is rare, however, for disease other than a malignancy to raise CEA above 10 ng/ml. Gastrointestinal malignancies that routinely cause elevations in plasma CEA levels include colon, pancreas and stomach. Carcinoma of the lung also cause elevated values in half to three-quarters of patients. To a lesser extent, carcinomas of the breast, thyroid, and the gynecological system may also cause high levels of CEA. CEA, once thought to be a marker for gastrointestinal malignancies, especially colorectal, has proven to be nonspecific (Table 1).

Table 1.—CEA Elevations in Other Disorders

Benign Disorders (CEA rarely exceeding 10 ng/ml)
Chronic lung disease
Pancreatitis
Diverticulitis, colonic
Chronic renal disease
Gastritis
Inflammatory bowel disease
Smoking (rarely exceeding 5 ng/ml)
Malignant Neoplasms
Pancreas
Stomach
Lung
Breast
Thyroid
Liver
Ovary, Uterus

The Role of CEA in Screening for Colorectal Cancer

In 1975, Stevens analyzed CEA levels as a screening tool in 956 individuals over 60 years of age.[2] Cancer was detected in 6 of 44 people (14%) with elevated CEA levels; however, 18 of 912 individuals (2%) with normal plasma levels were also found to have cancer. A year later data on 2,372 patients was published from Australia.[3] Nine of 73 individuals (12.3%) with elevated plasma CEA levels had a malignancy. Further, in 7 of these 9, malignancy was diagnosed before determining plasma CEA levels. Thus CEA values have proven to be insensitive, since only 2 of 2,372 asymptomatic patients were found to have malignancy. Except in high-risk individuals, including those with familial polyposis, ulcerative colitis, or previous colorectal cancer, CEA cannot be recommended as a screening modality.

CEA as a Prognostic Factor

Most patients with primary colorectal cancer do not present with an elevated CEA level, and high levels are related more to the stage of disease. In one study, elevations (>5 ng/ml) were observed in about 4% of patients with Dukes' stage A disease, 25% of those with stage B, 45% with stage C, and 65% with metastatic colon cancer.[4] In 1981, Staab analyzed numerous prognostic factors in 563 patients following resection of their colorectal cancer.[5] Plasma CEA levels correlated with stage of disease and provided an independent prognostic determinant of survival. Patients who have preoperative CEA levels greater than 10 ng/ml have a poorer prognosis than patients with values less than 10 ng/ml. Previously, Wanebo has shown that preoperative CEA values are a prognostic indicator in both Dukes' B and C cancers.[6] At 30 months, the proportion of Dukes' B patients free of disease was 44% in those with levels >5 ng/ml vs 78% in those with CEA <5 ng/ml. In patients with Dukes' C tumors, the difference was even more striking; the proportion free of disease at 30 months was 15% in those with levels >5 ng/ml vs. 41% of those with levels <5 ng/ml. In patients with distant metastases at the time of initial diagnosis, plasma CEA level was unrelated to length of survival. The concentration of CEA in sera from patients with poorly differentiated colorectal carcinomas may not be elevated because these tumors produce less CEA.[7] Since poorly differentiated carcinomas are more aggressive than those well or moderately differentiated, serum CEA may not be elevated in this group of patients who are more likely to develop metastases.

CEA &Resectability of Recurrent Cancer

Following surgical resection of colorectal carcinoma, elevated plasma CEA levels should return to normal within 4 to 6 weeks

ABBREVIATIONS USED
CEA: Carcinoembryonic antigen

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if all tumor has been removed. Once CEA has normalized, subsequent plasma elevation is frequently the first sign of locally recurrent or metastatic disease. About 25% of patients who have a curative surgical resection will have a recurrence, and 75% of these have a rise in CEA level several months before or coincident with the recurrent disease (including 44% of those who had a normal value prior to resection of the primary).[8,9] In 1974, Sorokin reported on 6 patients with progressively rising CEA levels in whom second-look laparotomy was performed and tumor recurrence identified.[10] In 1978, Minton and Martin studied 22 retrospective and 18 prospective patients undergoing second-look laparotomy for an elevated plasma CEA level.[11] In the prospective group, 17 of 18 patients (94%) were found to have recurrent disease, which was localized and resectable in 13 (72%). The importance of minimizing time delay was emphasized, since the average time delay to operation was 3 months longer for those with unresectable disease. In that same year, Wanebo performed second-look laparotomy in 16 patients based solely on elevated plasma CEA levels.[12] Fourteen were found to have recurrent disease, of which 7 (43.8%) then underwent curative resection.

Most patients with primary colorectal cancer do not present with an elevated CEA level, and high levels are related more to the stage of the disease.

Martin, in summarizing the Ohio State experience, noted that 58% of 146 patients with symptomatic CEA elevations were able to be resected for cure.[13] This figure is higher than the 10% to 40% resectability figure cited in the pre-CEA era, and is based on a policy of frequent CEA determination and early operation for mild CEA elevations. Finally, in a combined report of 400 patients followed by members of the Society of Surgical Oncology, 43 patients underwent second-look surgery solely (another 32 were clinically directed) because of an elevated CEA level; recurrent tumor was confirmed in 92%, with 30% remaining disease-free 5 years later.[14] Patients whose CEA levels were measured at intervals of <2 months versus those measured >2 months had a higher percent resectability (54% vs 20%), and a higher 5-year disease-free survival (33% vs 10%). Likewise, CEA values were between 2.5 and 11 ng/ml at the time of the second-look operation (24/38) of patients with resectable disease. Of the patients with CEA values above 11, only 30% (8/27) were resectable. The rate of CEA elevation (slope analysis) may differentiate localized from metastatic disease and thus predict site of relapse, with a rapid rise suggestive of liver involvement.[15] Minton and Martin developed a nomogram to improve the accuracy and reproducibility of the assay.[11] Assay samples were stored for re-evaluation with latter samples. If a follow-up sample fell outside the 95% confidence limit of normal, both samples were re-analyzed at the same time under the same conditions, allowing the patient's own sample to be a control.

Before advocating the use of CEA in the post-operative follow up of resected patients, it is important to look further into the published literature. Second-look surgery for colorectal carcinoma was initially reported by Wangensteen.[16] Procedures were done routinely every 6 to 8 months until the patient was deemed disease-free. The overall salvage rate for asymptomatic patients from this aggressive approach was 6.2% for colon cancer and 4.5% for rectal cancer. Unfortunately, this method was associated with a very high negative laparotomy rate. Eventually, clinically and radiographically directed second-look operations became the standard and are associated with resectability rates similar to those which are exclusively CEA-directed.[15] The problem is that whether re-operation is CEA- or clinically-directed, most patients with para-aortic nodes, omental tumor, or other peritoneal nodules are not amenable to curative surgical resection. Further, the pattern of recurrence influences the likelihood of CEA elevation. While 75% to 95% of liver metastases have CEA elevations, only 25% to 50% of local or regionally recurrent patients have such elevations.[17] Lastly, in addition to a significant false negative rate, the CEA assay is associated with at least a 7% false positive rate, leading to unnecessary evaluations and patient anxiety.[18]

We have previously calculated that roughly one-fifth of the total population with resected colorectal cancer will have recurrences associated with measurable CEA production. If half of these patients are resectable and 30% are disease-free at 2 years, then the conclusion would be that serial CEA determinations play a role in extending survival in just 3% (one-fifth x half x 30%) of the total population of resected colorectal cancer patients. Comparable programs cost approximately $25,000 per patient found to have resectable cancer.[19] If 30% of such patients are actually rendered disease-free, the true cost is near $100,000 per patient cured. This is important, especially when we realize that to date no comparative trial has been shown to have an impact on survival. In a retrospective review of a large national (intergroup) surgical adjuvant trial, 417 CEA-monitored patients with recurrence of colorectal cancer were studied.[20] Fifty-nine percent had a preceding elevation of CEA concentration, and 2.3% (2.9% of those with CEA elevations and 1.9% of those with no elevations) are alive and disease-free more than 1 year after salvage surgery; however, of those with no CEA monitoring, 2.0% are also alive and disease-free more than 1 year after salvage surgery. The SSO trial, in fact, found that the curves for patients surviving after CEA-directed vs clinically-directed second-look surgery were identical. In 1983, a 2,000-patient study was organized in Great Britain to evaluate CEA-prompted second-look surgery. The results of this prospective randomized trial should help resolve the question of whether routine post-resection CEA determinations are warranted.[21]

. . . CEA, once thought to be a marker for gastrointestinal malignancies, in particular colorectal, has proven to be nonspecific.

Until the results of the British trial become available, we must make decisions regarding the advisability of post-resection CEA testing based on available data. Sixty percent of recurrent disease develops within the first 2 years and 90% within 5 years. If CEA testing is to be effective, the assay should be obtained frequently (every 4 to 6 weeks post-operatively for the first 2 years, every 8 to 10 weeks for the next 3 years) and acted upon when elevations are mild (5-11 ng/ml).[13] Median lead time, from the first elevation in CEA to the diagnosis of recurrent disease, is about 6 months.[18] In one county survey, only 23% of physicians checked CEA levels at least every 2 months during the first post-operative year, and during the second year, no respondents checked levels that frequently.[22] There is information to suggest that serial determinations of CEA could be more selective if tissue production of CEA were taken into account, as elevations post-resection are more likely when the original tumor is stained with anti-CEA antibodies.[23] At Ohio State, in an attempt to improve the results of second-look surgery, a technique (RIGS) was developed to detect, intra-operatively, an iodine-125-labeled monoclonal antibody that presumably binds clinically and radiographically-occult tumor.[24,25]

CEA Testing to Monitor Response to Palliative Treatment

When chemotherapy is employed to control metastatic or unresectable colorectal cancer, a correlation usually exists between

the response to therapy and the CEA concentration. This fact is particularly important as an indicator of tumor burden, if the disease is otherwise not measurable. Palliative chemotherapy was applied to 131 patients at Roswell Park with serial CEA determinations.[26] There was disease progression in 84 instances with 80% showing an increase in CEA above pre-treatment or maintaining high levels; clear-cut regression occurred in only 9 cases; in all 9, the CEA dropped or maintained low values throughout the period of regression.

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Changes in the Overall Management of Rectal Carcinoma

Clarence H. Soderberg, Jr., MD, J. Robert Bowen, MD,
Brian A. Dorman, MD, John C. Pezzullo, PhD, Victor E. Pricolo, MD,
Thomas K. Shahinian, MD, and William R. Thompson, MD

The records of 276 patients who underwent surgical treatment for rectal carcinoma over a 23-year period were reviewed in order to report changes in surgical management.

Changes in the management of rectal carcinoma have occurred during the past several years. Refined methods of screening, with increased use of flexible endoscopy, identification of tumor markers, and changes in operative techniques utilizing stapling devices are some of these improvements.

The authors' experiences with 276 operative cases of rectal carcinoma were reviewed to assess possible changes in their management. Patients were grouped by decade and their results compared.

Material and Methods

The study population consisted of 276 patients, 140 males and 136 females. Their ages ranged from 32 to 92 years. All patients had invasive carcinoma of the rectum up to a distance of 15 centimeters from the anal verge. Each patient underwent surgery, other than biopsy alone, performed by five members of the Second Surgical Service at the Rhode Island Hospital, an affiliate of Brown University School of Medicine.

Operations were performed between September 1964 and November 1987. The records were reviewed retrospectively, and the data were entered into a microcomputer database for subsequent analysis. Presentation, diagnostic methods, type of surgery, operative findings, pathology, complications, mortality and morbidity, associated therapies, and end results were examined. Intergroup differences were compared and tested for significance by means of multivariate survival regression using a constant hazards model as previously described.[1] Survival probability was estimated by the method of Kaplan and Meier.[2]

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Clinical Presentation

Rectal bleeding and change in bowel habits were the most frequently recorded signs and symptoms and were consistently present in a high percentage of cases during the entire study period. Bleeding occurred in 56% of the cases as the initial complaint and in 65% of all patients. A change in bowel habits was the initial complaint in 69 (25%) and was present overall in 43% of patients. The carcinoma was recorded as being palpated on rectal examination in 38 (11%), and this was the presenting feature in 11 (4%). Eleven patients (4%) presented with acute obstruction, and this was present also in 7 others (3%). Anemia with a hemoglobin of less than 12 gms was found in 45 patients (16%). A decrease in stool caliber was noted in 16 patients (6%). A significant amount of rectal pain was noted in 21 patients (8%).

Screening methods utilizing rectal examination, stool occult blood testing, or endoscopy were responsible for identifying only 24 cases (9%) of the entire series.

Screening methods utilizing rectal examination, stool occult blood testing, or endoscopy were responsible for identifying only 24 cases (9%) of the entire series. Routine rectal exams led to the discovery of only 1 case (4%) in the 1960s, 3 (3%) in the 1970s, and 7 (5%) in the 1980s.

Over the years increasing use of flexible endoscopy has occurred, and in recent years it is performed in all cases. Barium enema examination, therefore, has become less important, and it was not performed in 44 (29%) of the cases in the 1980s.

A rigid sigmoidoscopy was performed in all cases of the 1960s and was still employed in a high percentage (72%) of the cases in the 1980s.

Routine endoscopy discovered the cancer in 1 case (1%) in the 1970s and 5 cases (3%) in the 1980s. Occult blood testing of the stool and follow up led to the diagnosis of only 7 cases (5%) in the 1980s.

Determination of CEA levels was more frequently performed in recent years. It was found to be elevated 22% of the time in cases of rectal cancer.

Operative Treatment

The most frequent operation performed in the 1960s was an abdominoperineal resection with permanent colostomy in 60% of cases. This was performed in 43% of cases in the 1970s and in only 28% of cases in the 1980s.

When a low anterior resection was performed in the most recent decade, a stapled anastomosis was more frequently used than a hand-sewn one (69% vs 26%). The opposite was true with our earlier cases (37% vs 11%).

A Hartman procedure was used in only 12 instances, (4% of all cases) 1 in the 1960s, 8 times in the 1970s and only 3 times in the 1980s.

A protective ostomy was performed only twice, one in each of the first two decades of the study.

Local resection of a malignancy was performed once in the 1960s, 3 times in the 1970s, and 11 times in the 1980s.

A parasacral resection was performed only once in the last decade.

Adjuvant Therapy

Adjuvant radiation therapy was used 11 times pre-operatively and 19 times post-operatively, or approximately 8% of the

ABBREVIATIONS USED
APR: Abdominoperineal resection
AR: Anterior resection
EEA: End-to-end anastomotic stapler

Table 1.— Modified Astler Coller Staging			
Stage		No.	%
A	Superficial to Muscularis Propria 30 11		
B	Invasion into Muscularis Propria	65	24
B_2	Invasion Through Entire Wall	70	25
B_3	Involvement of Adjacent Organs	1	0.4
C_1	Confined to Wall with Positive Nodes	8	3
C_2	Invasion Through Entire Wall with Positive Nodes	59	21
C_3	Involvement of Adjacent Organs with Positive Nodes	3	1
D	Distant Spread	40	14

time in both of the later decades.

Adjuvant chemotherapy was utilized in only 7 instances in the entire series.

Operative Findings

A modified Astler Coller classification (Table 1) was used for this series, and the percentage distribution for each stage is illustrated in Table 1.

The tumors had invaded through the entire wall in 133 or slightly fewer than half of the patients (48%), and distant spread was seen in an additional 40 patients (14%).

Succeeding decades had an increasing number of early lesions (A,B): 1960s–20%; 1970s–31%; 1980s–39%, and a decreasing number of late (D) lesions: 1960s–24%; 1970s–14%; 1980s–12%.

The most frequent operation performed in the 1960s was an abdominoperineal resection with permanent colostomy in 60% of cases. This was performed in 43% of cases in the 1970s and in only 28% of cases in the 1980s.

Liver metastases were found at the initial operation in 28% of those performed in the 1960s, 12% in the 1970s, and only 11% in the 1980s. Solitary metastases were present in only 3% of the entire series and in only 19% of those having liver metastases.

Surgery was only palliative in 27% of cases in the 1960s, 15% in the 1970s and 14% in the 1980s.

Pathology

In situ carcinomas and carcinomas arising in polyps without definite invasion of the stalk were not included in this series. A rectal resection was indicated in all cases. The pathological reports were recorded, but the original slides were not reviewed. The degree of differentiation was not always mentioned, but when stated it was recorded as in Table 2.

Complications

There were four hospital deaths, all occurring in the 1980s, for an overall operative mortality of 1.4%. No deaths occurred among the 122 patients operated on in the 1960s and 1970s.

Each succeeding decade had fewer complications; 52%, 43% and 35%.

Wound infection was the most common complication and occurred in 8% of patients in the 1960s, 142 in the 1970s, and 5% in the 1980s.

Urinary retention also occurred frequently; 4% in the 1960s, 2% in the 1970s, and 5% in the 1980s. Of the above 23 patients who could not void, 11 required operation. The third most common complication was post-operative paralytic ileus, which occurred in 13 (5%).

The complications are listed in Table 3.

Results

The first area of recurrence was, in order of decreasing frequency: local, liver, suture line, regional nodes, bone, and lung.

The local area was the first site of failure in 122 of the patients in the 1960s, 212 in the 1970s, and 102 in the 1980s.

If all the local recurrences are tabulated with or without other areas of recurrence or metastases, the figures for each succeeding decade are 19% in the 1960s, 27% in the 1970s, and 12% in the 1980s. Suture line recurrences were 4% in the 1960s, 7% in the 1970s, and 5% in the 1980s. These differences are not statistically significant.

Kaplan-Meier survival curves were constructed for the overall group and for patients in the 1960s, 1970s and 1980s (Figure 1).

To assess current treatment methods used only in the 1980s, survival curves for abdominoperineal resection, low anterior resection with sutures, and low anterior resection performed with the EEA stapling device were compared (Figure 2).

Discussion

In Rhode Island, as in the United Kingdom,[3] earlier lesions are now being discovered more frequently than in previous decades. The diagnoses, however, are still being made only after the development of advanced signs or symptoms, such as bleeding or change in bowel habits. Because of this, more than half (61%) of the current cases represent advanced stages of rectal cancer (B or worse).

Screening methods have been shown to lead to the earlier diagnosis of colorectal malignancies;[4] however, they have apparently been under-utilized in our area, leading to the discovery of the tumor in only 9% of the series. Although flexible endoscopy is being used more in the study of these patients, only a small percentage (3%) of cases in the 1980s was discovered by routine endoscopy.

In situ carcinoma and carcinomas arising in polyps without definite invasion of the stalk were not included in this series.

Surgery for colorectal carcinoma can be performed quite safely and an in-hospital mortality of only 1.4% is reported. Morbidity rates, although decreasing, remain high (35%). The same types of complications continue to occur with wound infection still the most common.

The first site of failure in our series, most frequently, was local recurrence. The increased use of stapling instruments in the 1980s, however, was associated with a decrease in the frequency of local recurrence and also fewer suture-line recurrences than in the 1970s.

Only recently has it been shown that adjuvant chemotherapy can substantially reduce the recurrence rate for patients with resected, but poor prognosis, colorectal cancer.[5] Therefore, it is not surprising that only seven patients in the entire series had chemotherapy as an adjuvant. Radiation therapy was utilized as an adjuvant in 8% of the patients treated since 1970. There is insufficient data to appraise its value.

Stapling instruments have certainly been accepted at our institution and have had increasing use over hand-sewn anastomoses

Table 2.—Histopathologic Characterisics in Resected Rectal Cancers				
Decade of Resection	Moderately Well Differentiated	Well Differentiated	Undifferentiated	Mucinous
1960s	23%	38%	31%	8%
1970s	38%	49%	8%	5%
1980s	39%	49%	6%	6%

Table 3.—Post-Operative Complications in 276 Patients with Rectal Cancer	
Wound Infection	24
Urinary Retention	23
Ileus	13
Urinary Tract Infection	9
Intraperitoneal Abscess	8
Post-Operative Hemorrhage	7
Anastomotic Leak	6
Cerebrovascular Accident	5
Phlebitis	3
Pulmonary Emboli	3
Pulmonary Infection	3
Perineal Sinus	2
Cardiac Arrhythmia	2
Respiratory Failure	2
Sepsis	1
Myocardial Infarction	1
Upper Gastrointestinal Bleeding	1
Small Bowel Obstruction	1
Dehiscence.	1
Others	18

and have lessened the need for abdominoperineal resection with permanent colostomy. It was, therefore, disturbing when a study of 34 cases by Hurst et al[6] concluded that the staple-gun technique of low anterior resection avoids colostomy at the expense of early anastomotic recurrence. Other small series of staple use for anterior resection by Rosen et al[7] (44 patients), Bisgaard[8] (35 patients), and Ziv[9] (55 patients) reached similar conclusions (ie, increased local recurrences). Warneke et al[10] reported a high rate of local recurrences (23%) following sphincter-saving resections for cure, as compared to the recurrence rate of 6% for abdominoperineal resection performed at the same institution.[11] Neville et al,[12] reporting a Ten-Hospital review, found a significant increase in local recurrences in cancers between 7-10 cm from the anal verge. Thirty-two percent occurred with the use of the EEA, as compared to 13% with abdominoperineal resections.

. . . adjuvant chemotherapy can substantially reduce the recurrence rate for patients with resected, but poor prognosis, colorectal cancer.

Gillen and Peel,[13] in reporting the considerable experience of one surgeon (55 stapled v. 45 APR), found the risk of local recurrence, morbidity, and mortality of the sphincter-saving operation to be comparable to the more radical abdominoperineal procedure. Somewhat larger series[14-18] have also compared the results of the use of stapling devices with sphincter preservation to abdominoperineal resections and have found no increase in local recurrence or decrease in survival. From a large NSABP experience, Wolmark et al[19] reports no disadvantage in the use of staples when compared to hand-sewn anastomoses in disease-free survival, survival, or local recurrence.

Our experience with the increased use of stapling instruments and the decreased need for abdominoperineal resection had not resulted in a decrease in survival (Figure 1) or an increase in local recurrence.

When survival curves were constructed, for our experience in the most recent decade of abdominoperineal resection, EEA and hand-sewn anastomosis, (Figure 2) the EEA anterior resection appears to have better survival results; however, the differences are not statistically significant.

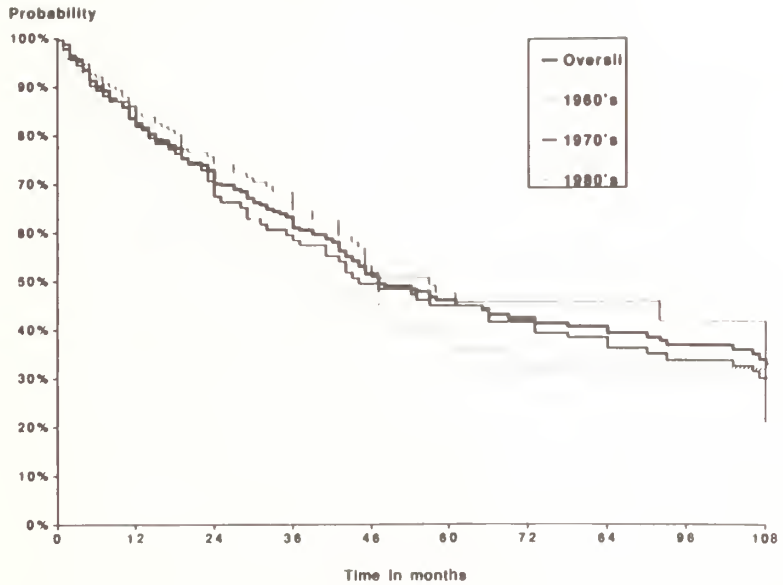

Fig 1.—Kaplan and Meier survival curves: Overall—all 276 patients; 1960s—25 patients; 1970s—97 patients; 1980s—154 patients.

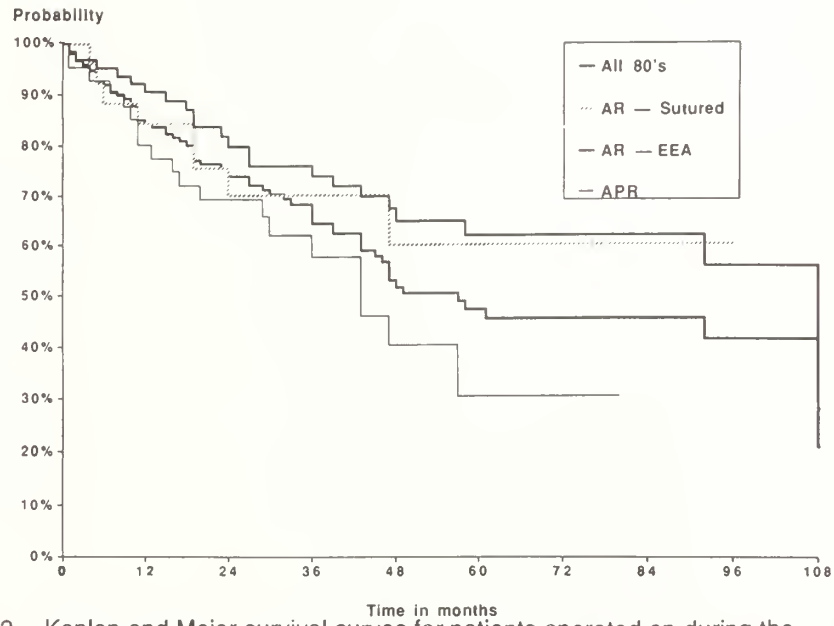

Fig 2.—Kaplan and Meier survival curves for patients operated on during the 1980s: All 1980s—all 154 patients; AR-sutured—26 sutured anterior resections; AR-EEA—69 stapled anterior resections; APR—43 abdominoperineal resections.

Conclusions

The records of 276 patients who underwent surgical treatment for rectal carcinoma over a 23-year period were reviewed in order to report changes in surgical management. Patients continued to present in a similar manner with bleeding (65%) and change in bowel habits (43%). Screening methods identified only a few patients (9%). Abdominoperineal resections are less frequently utilized. Stapled rectal anastomoses are now more common than hand-sewn. Adjuvant radiotherapy was used in 8% and adjuvant chemotherapy in 3% of cases. Less advanced tumors are being diagnosed (A, B^1, 39%); however, surgery is still palliative in 14%. The overall surgical mortality rate is low (1.4%); however, morbidity rates remain high (35%). Local recurrence continues to be the first site of failure; however, the rate does not appear to be adversely related to the increasing use of sphincter-saving operations.

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Rubber Band Ligation of Hemorrhoids

Daniel E. Wrobleski, MD

A retrospective review of 384 patients who had undergone rubber band ligation for hemorrhoidal disease by one surgeon from 1988 to 1993 is presented.

Rubber band ligation of hemorrhoids, a simple, safe and effective means of treating symptomatic internal hemorrhoids, represents an alternative treatment to operative hemorrhoidectomy. In an effort to reduce the morbidity associated with surgical hemorrhoidectomy, various outpatient procedures have been introduced in recent years. Rubber band ligation has become the most popular of these alternative procedures.

The concept of ligation of hemorrhoidal tissue was revived by Blaisdell[1] and later modified, using a rubber ring, by Barron in 1963.[2] Several studies have emphasized the simplicity, safety, and patient acceptance of this procedure.[3-5] Other reports have established the effectiveness of this technique in relieving the symptoms of internal hemorrhoids.[6-8] This report describes the rubber band ligation technique and reviews its effectiveness as an outpatient procedure.

Technique

The procedure is performed in the office without the use of sedation. Preparation consists of a single sodium biphosphate (Fleet) enema taken approximately 1 hour before the procedure. Patients who are taking aspirin, nonsteroidal anti-inflammatory drugs and anticoagulants are asked to refrain from these medications for 1 week before and 2 weeks after the procedure.

The procedure is performed through an anoscope using a McGivney rubber band ligator. This ligator consists of a drum upon which the rubber ring is secured and a shaft which connects the drum to a trigger handle. When the trigger is activated, the rubber ring slips off the drum. An anoscope is inserted into the anal canal and distal rectum, exposing the internal hemorrhoids. The dentate line separating the distal rectal mucosa and anoderm must be identified. The most prominent hemorrhoid is treated first. The hemorrhoid is grasped with a forceps approximately 1 cm above the dentate line, an area typically devoid of pain fibers. The tissue is pulled up into the drum of the ligator which has been inserted into the anoscope. The trigger is then released, the rubber band which strangulates the tissue within the drum. If the band is placed well above the dentate line, the patient should experience no pain. Slight discomfort or fullness in the rectum may be anticipated for a few days. This is relieved with sitz baths and mild analgesics.

Several treatments, spaced over 3-week to 4-week intervals, may be required to alleviate the symptoms. A single hemorrhoidal site is usually treated at each visit. However, ligation of two or three sites at one time has been performed with good results.

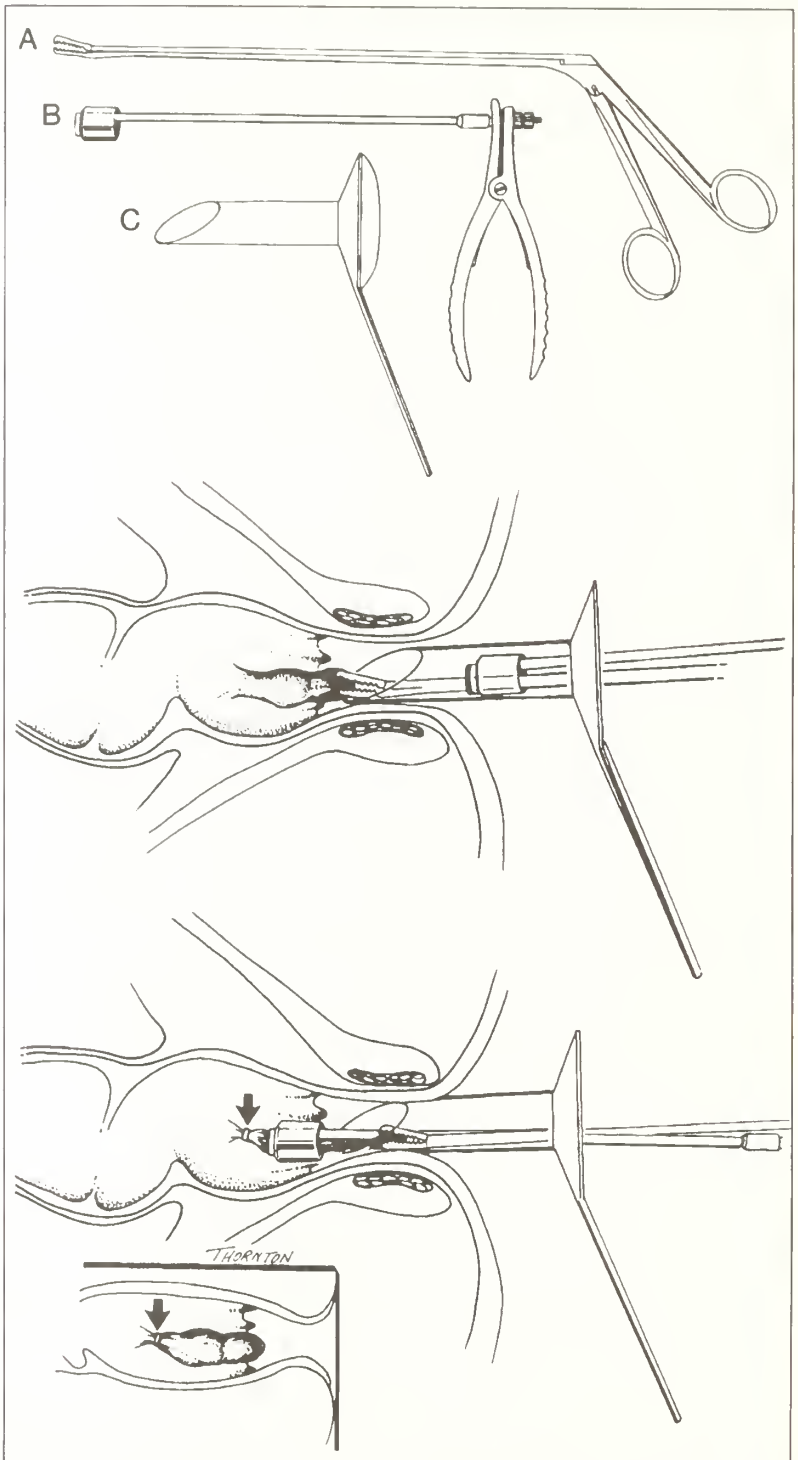

Fig 1.—Top, the instruments required for rubber band ligation of hemorrhoids: forceps (A), McGivney rubber band ligator (B), and anoscope (C). The hemorrhoid is located and drawn into the anoscope with the forceps (middle), and using the ligator, a rubber band is placed above the dentate line of the hemorrhoid (bottom).

Daniel E. Wrobleski, MD, is clinical instructor in surgery, Brown University School of Medicine and divisional director, Colon and Rectal Surgery, Roger Williams Medical Center, Providence, RI.

Materials and Methods

Records from 1988 to 1993 were reviewed of 384 consecutive patients who had undergone outpatient rubber band ligatures of hemorrhoids treated by the author. Patents who had additional anorectal procedures were excluded from the study. All patients were treated at monthly intervals until symptoms were satisfactorily relieved, alternative therapy initiated, or the patient declined further treatment. The effectiveness of the treatment was assessed at the completion of therapy. The primary indications for treatment were rectal bleeding and prolapse secondary to internal hemorrhoids. Many patients complained of both prolapse and bleeding. The most significant of these symptoms was considered to be the primary indication for treatment.

Two hundred seventy-six (72%) were treated for rectal bleeding. Prolapse of hemorrhoidal tissue was considered the primary indication in the remaining 108 patients (28%) (Table 1).

Table 1.—Indications for Treatment by Rubber Band Ligation in 384 Patients, and Post-operative Result

Indication	Percent	Percent Improved
Bleeding	72%	92%
Prolapse	28%	82%

Results

Three hundred forty three patients (89%) were significantly improved or free of all symptoms following therapy. Patients whose primary symptom was rectal bleeding did considerably better than those in whom rectal prolapse was the primary indication for treatment. Of the 276 patients with rectal bleeding, 254 (92%) had a satisfactory result. Eighty-nine (82%) of the 108 patients with prolapse as the primary indication were satisfactorily improved or free of all symptoms (Table 1). The number of bands needed to obtain a satisfactory result ranged from 1 to 9, the average number of bands applied being 3.4. Multiple bands were applied at a single visit in 18% of the patients treated.

The procedure was associated with infrequent morbidity. Thirty-six patients (9%) noted a moderate degree of pain during the course of treatment. Severe delayed rectal bleeding occurred in 3 patients (0.8%). These 3 patients required hospitalization and fulguration or suture ligation of the bleeding site. There were no associated infections.

Discussion

Since its introduction, hemorrhoidal ligation has been considered safe and effective. The procedure allows removal of a small amount of hemorrhoidal tissue with subsequent fixation of the rectal mucosa by scarring. Fibrosis of the rectal mucosa prevents further prolapse. Prevention of mucosal prolapse will eliminate bleeding associated with symptomatic hemorrhoids.[9-10]

Several studies have confirmed the effectiveness of this procedure. Lau and associates found good to excellent results in 91% of their patients treated with multiple ligations. A retrospective review of patients treated at the Lahey Clinic revealed that 80% remained improved 3 years after treatment.[7] Steinberg and co-workers found a great majority of patients (89%) considered themselves cured or greatly improved by the treatment. However, only 44% of patients were free of all symptoms.[6]

Patient selection influences results. Individuals with advanced disease may still require a surgical hemorrhoidectomy. The Lahey Clinic study noted that only 26% of the patients with irreducible hemorrhoids achieved a good result.[7] Serious morbidity in this study was confined to delayed hemorrhage which occurred in less than 1% of patients. Others have described rare but fatal septic complications.[12] Infections were attributed to retroperitoneal cellulitis with subsequent sepsis and toxic shock. Early recognition of this severe complication may prevent a fatal outcome.[13]

Summary

A retrospective review of 384 patients who had undergone rubber band ligation for hemorrhoidal disease by one surgeon from 1988 to 1993 is presented. The primary indications for treatment were rectal bleeding and prolapse. Eighty-nine percent of the patients were improved following treatment. In selected patients, rubber band ligation is an acceptable alternative to surgical hemorrhoidectomy.

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Rhode Island
Department of Health
Patricia A. Nolan, MD, MPH
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Edited by Jay S. Buechner, PhD
Chief, Office of Health Statistics

Colorectal Cancer Mortality in Rhode Island

Differences across nations in colorectal cancer mortality are strongly related to differences in diet. In nations where diets consist largely of complex carbohydrates there is little colorectal cancer mortality; nations in which complex carbohydrates are supplanted by fats have high colorectal mortality. Even though supporting data from clinical trials are not currently available, the ecological relation between diet and colorectal cancer is so strong that the American Cancer Society and the National Cancer Institute both recommend modifications in the American diet to reduce the proportion of calories from fat. The RI Department of Health has selected two related Year 2000 health objectives[1] to guide public health interventions in this area:

1. "Increase healthy diet, by reducing dietary fat intake to 30% of calories or less and saturated fat intake to less than 10% of calories among 60% of people aged 2 and older. (*Healthy People 2000*, Objective 2.5)," and
2. "Increase healthy diet, by increasing complex carbohydrates and fiber-containing foods in the diets of 60% of adults to 5 or more servings of vegetables (including legumes) and fruits, and to 6 or more daily servings for grain products. (*Healthy People 2000*, Objective 2.6),"

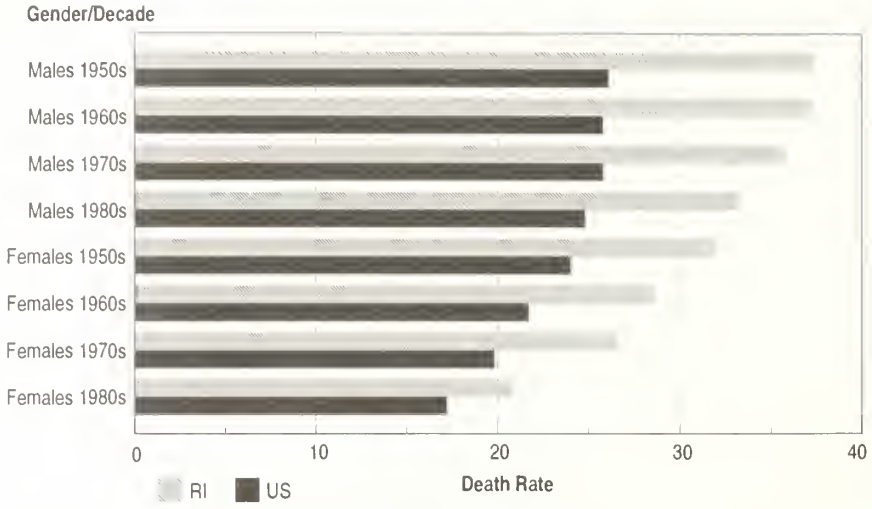
To begin to meet these objectives, the department has established a "Five a Day for Better Health" program, promoting increased dietary consumption of fruits and vegetables.

As part of the effort to monitor Year 2000 health objectives for the state, the department has examined colorectal cancer

Table 1.—Cancer rates used in Figures 1 and 2

Gender/Decade	RI	US	RI/US
Males 1950s	37.3	26.1	1.43
Males 1960s	37.3	25.8	1.45
Males 1970s	35.8	25.8	1.39
Males 1980s	33.2	24.8	1.34
Females 1950s	32.0	24.0	1.33
Females 1960s	28.6	21.7	1.32
Females 1970s	26.6	19.8	1.34
Females 1980s	20.8	17.2	1.21

Rates are average annual, age-standardized, using the 1970 US population as standard, expressed as deaths per 100,000 population.



Rates are average annual, age-standardized, using the 1970 U.S. population as standard, expressed as deaths per 100,000 population.

Fig 1.—Death rates, colorectal cancer, whites, 1950-1989, Rhode Island and the US, by gender and decade

Rates are average annual, age-standardized, using the 1970 U.S. population as standard, expressed as deaths per 100,000 population.

Fig 2.—Death rates, colorectal cancer, 1980-1989, Rhode Island and the US, by race and gender

Submitted by John P. Fulton, PhD, Division of Preventive Health Services. Health by Numbers *is edited by Jay S. Buechner, PhD, and William J. Waters, Jr., PhD*

mortality statistics both in Rhode Island and in the US.

Methods

Mortality rates for whites, 1950–1989, were extracted from official publications of the US government.[2,3] Rhode Island mortality rates for the period 1980–1989 were constructed from Rhode Island vital records, using US census data for 1980 and 1990. All rates were age-standardized using the 1970 population of the US as the standard population. Rhode Island mortality rates for African-Americans, based on few deaths, are associated with large standard errors. These rates should be interpreted with caution.

Observations

Mortality from colorectal cancer among whites declined steadily over 40 years of observation (Figure 1). The decline was proportionately greater among females (RI: 35%; US: 28%) than males (RI: 11%; US: 5%). Colorectal cancer mortality was higher among males than females throughout the period in both areas. Mortality from colorectal cancer among whites of both genders was substantially higher in Rhode Island than the US. However, this difference diminished over time, from 43% during 1950–59 to 34% during 1980–89 among males, and from 33% to 21% among females (Table 1).

Table 2.—Death rates, colorectal cancer, 1980-1989, Rhode Island and the US, by race and gender

Race/Gender	RI	US	RI/US
White Males	33.2	24.8	1.34
Black Males	29.1	27.0	1.08
White Females	20.8	17.2	1.21
Black Females	25.3	20.7	1.22

Rates are average annual, age-standardized, using the 1970 US population as standard, expressed as deaths per 100,000 population.

In the US, African Americans had higher colorectal cancer mortality than whites in the 1980s (Figure 2). In Rhode Island, mortality among African American females was higher than that for white females, but the opposite was true among Rhode Island males. However, the racial differentials observed in Rhode Island are not statistically significant. Mortality was higher in Rhode Island than the US as a whole across all race-gender combinations.

Discussion

The decline in colorectal cancer mortality observed in Rhode Island and the US since the 1950s is most likely the result of improved case finding and treatment. Tumors have been detected earlier, and improvements in surgery have allowed a higher proportion of tumors to be treated successfully, especially among the elderly.[3] The American diet also improved slightly in the 1980s, and possibly as a result, the incidence of colorectal cancer in the US began declining in 1986.[3] Although these trends cannot explain a decline in mortality that began in the 1960s, they may fuel further mortality reductions, if dietary change can be maintained and accelerated through public health interventions such as "Five a Day for Better Health."

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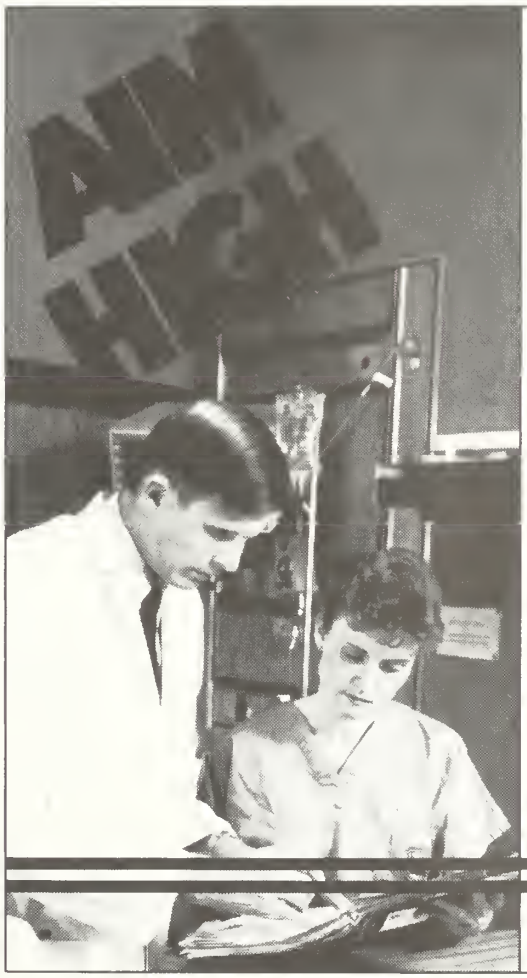

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90 Years Ago (June 1905)

John E. Donley, MD, of Providence offers a learned essay on the life and contributions of Francis Joseph Gall, the great neuroanatomist. Gall was born in a small Swabian village of southern Ger-many in the year 1758. He was educated at the Universities of Strasbourg and Vienna, receiving his medical training from the latter. His early lectures on cerebral localization, tacitly denying the existence of the soul, were promptly banned by the Austrian government. Gall then moved to Napoleonic Paris in 1807 where he ultimately published his great four-volume text, "*The Anatomy and Physiology of the Nervous System, with Observations upon the Possibility of Ascertaining several Intellectual and Moral Dispositions of Man and Animals by the Configuration of their Heads.*" Gall, in essence, tried to find "a local habitation" in the brain for each of his mental abstractions, founding the so-called science of phrenology. He believed that each individual possessed a peculiar, distinctive array of propensities and faculties and that these, in some fashion, were represented by differences in the configuration of the brain and, inevitably, the shape of the outer skull. The shape of the skull, in his view, only reflected the circumstances within subjacent tissues. "I never went so far as to imagine that the cause of the moral qualities or the intellectual faculties resided in such or such a place in the bones of the cranium." He concluded, years later, that the brain is composed of ". . . as many organs as there are propensities, sentiments and faculties, which differ essentially from each other." He recognized that the fundamental question to be resolved was this: "Is the exercise of the moral and intellectual faculties of man dependent upon organization, that is, upon a material organ, the brain, or does it depend upon an immaterial, spiritual being, the soul, which is above and beyond any organization?" Dr Donley concludes that although Gall's system is inadequate his principle (ie, the localization of function to various parts of the brain) is true and that "cerebral physiology, so far as it exists at all, is but a refined and more cultured phrenology."

Dr Frederic Gorham, professor of biology at Brown, discusses the bacteriology of diphtheria, dwelling first upon the initial recognition by Klebs (1883) and Loeffler (1884) that this bacterium, now called the Klebs-Loeffler bacillus, is the cause of morbid laryngitis. The author asks whether the Klebs-Loeffler bacillus is always present in the disease; whether it is ever present in healthy persons; and whether it will produce an analogous disease in experimental animals. He then considers the pathological role of the elaborated toxins. He concludes with the emphatic observation that the diphtheria bacillus produces disease only by means of the toxins which it manufactures.

50 Years Ago (June 1945)

The text of the fourth annual Charles V. Chapin Oration is presented. Francis G. Blake, MD, dean of the Yale School of Medicine discusses recent advances in the control of infectious diseases. The author classifies diseases, first, by those which may be controlled by passive immunization (eg, infectious hepatitis and measles) through the prudent use of gamma globulin or convalescent serum. He then considers diseases which respond to active immunization, such as influenza. His discussion proceeds, then, to the prevention of threatened infection by mass administration of a suppressive agent. He cites the use of single or periodic doses of oral sulfadiazine in diminishing the carrier rate of meningococcal pharyngitis, and the consequent reduction in the number of cases of mening-ococcal meningitis. The next category is the control of acute respiratory infection by sanitary environmental intervention (ie, aerosol antiseptics and physical barriers in living spaces). Finally, Blake discusses the treatment of communicable disease (such as primary syphilis) with antibiotics such as the newly available penicillin.

Elihu S. Wing, MD, president of the RI Medical Society in 1944–45, writes on medical care in the state. He cites first the numbers and distribution of the 7,032 registered hospital beds in the state, accommodating 54,377 admissions in 1944. This does not include an additional 1,610 US Navy beds in the state with 20,419 military admissions. The article then summarizes data on such health care elements as the numbers and distribution of the 3,419 nurses, active or retired, in the state. Finally, the author compares the rank order—and death rates—within the Rhode Island population of 1944 and 1920, noting the great increase in deaths ascribed to heart disease and cancer and the notable decrease in deaths secondary to pneumonia and tuberculosis.

Louis I. Kramer, MD, reports on a case of empyema in a 68-year-old sheet metal worker successfully treated with penicillin.

The *Journal* provides the entire text of the proposed Wagner-Murray-Dingell Act introduced in Congress on May 24, 1945 as amendments to the Social Security Act. Peter P. Chase, MD, editor of the *Journal*, writes an editorial on the content and implications of this legislation. The advent of V-E Day and the end of hostilities in Europe means a massive redeployment of some 3 million soldiers currently based in Europe, many to be discharged. The *Journal* also lists 16 local physicians who have received honorable discharges.

25 Years Ago (June 1970)

Most of this issue of the *Journal* is devoted to articles honoring Butler Hospital as it celebrates its 125th year of service to the community. The first three papers discuss the diversity of urban mental health services in various nations.

Louis Miller, MD, writes about the urban mental health programs in Israel noting the wide range of health services which, while overburdened, are still capable of providing both individual and family types of therapy.

Professors A.V. Snezhevsky and M.E. Vartanian describe some of the urban mental health resources in the Soviet Union paying particular attention to the role of external stress factors causing psychoses.

Lawrence Kolb, MD, presents evidence that the inescapable pressures of urban existence increase the incidence of various neurotic and personality disorders. These papers are then discussed by a distinguished panel of psychiatrists including Stanley Yolles, MD, Walter Barton, MD and Howard Rome, MD.

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COMMENTARIES

One Third of a Profession

Each year, for the past two decades, RHODE ISLAND MEDICINE has assigned one of its summer issues to a description of the newly graduated class of the Brown University School of Medicine. Each year, some 80 men and women enter a noble yet troubled profession: noble because it continues to fulfill its declared mission to care, to nurture, and sometimes to cure; troubled because it sees its autonomy increasingly circumscribed and its clinical decisions "managed" by vast socioeconomic priorities that weigh the patient's well-being as only one of many variables.

This year, we welcome to our midst the Brown medical class of 1995, 71 new colleagues now beginning as first year resident physicians in 54 different hospitals (51 civilian, 3 military) located in 20 different states and the District of Columbia. Their 4 years of undergraduate medical education, of course, had not been accomplished in some computer-dominated vacuum. These 71 students were surrounded, prodded, challenged, occasionally berated, nurtured and certainly encouraged by a committed medical faculty of 430 full-time individuals joined by a cadre of over 880 physicians in private practice. This medical faculty, full-time and voluntary, materially aided in the clinical learning process by lecturing, by counseling and above all, by example.

Thirteen hundred physicians: this astonishing number should not be accepted casually; it should be viewed with the due respect that it deserves. Thirteen hundred physicians in Rhode Island—representing over one-third of the total population of licensed physicians in this small state—are actively engaged, most without salary, in the educational supervision both of Brown's medical students as well as a collective house staff numbering over 400. At no time does this teaching process ever cease. Choose any holiday, any leisurely Sunday afternoon, any sepulchral hour between midnight and dawn, and you will encounter some ministering physician in the hospital corridors—followed by sleep-deprived clinical clerks eager to absorb the mysteries of medical therapy. The recompense for this voluntary clinical faculty consists of a nominal university title and the knowledge that those they teach will be smarter, more skilled and ultimately better able to address their patients' needs than they.

There is no calling, no enterprise, no profession that can make such a proud claim of voluntarily participating in the preparation of those who will first learn from us, then compete with us and finally succeed us. Certainly no physician among us has arrived at his present station without the active, voluntary assistance of older, wiser medical colleagues.

Members of the cost-benefit fraternity periodically announce that teaching is an inefficient undertaking; they have suggested that interactive computer programs might be eminently more effective than the imperfect interaction between teacher and medical student. Perhaps. But worth recalling is the tale of a Chinese emperor who commanded his ministers to seek out the wisest physician in all his kingdom. The search went on for interminable months until finally the ministers were satisfied that their choice had indeed fulfilled the emperor's mandate. On a specially chosen morning, the selected physician was presented to the imperial court. The wise-physician sat upon a special rug before the throne. The emperor, about to question the physician, noticed another person sitting quietly at the rear of the rug. And the emperor asked: "Who is this behind you, wise one?" And the physician answered: "This is my teacher."

The process of teaching, like parenthood, is quite asymmetrical. The seeds planted by the fervent clinical preceptor will not flourish instantly. The more enduring clinical skills, even the needed commitment to life-long learning, may not emerge in the younger physician until many years have passed, until long after the clinical instructor's image—and even name—have been lost to readily available memory. What is taught is often better remembered than the one who taught it: and this is as it should be. In the busy life of the active physician, moreover, little time can be invested in nostalgic reveries about former clerkship preceptors.

There is little reciprocity between the clinical teacher and his or her clinical clerk, as there is little symmetry between parent and child. In each case, the movement is toward the future—and the priority to resolve the tasks at hand. Rarely indeed are thanks ever given. The past, perhaps only dimly remembered, is never fully dead; indeed, it is not past. It prevails in those buried memories of our former students, memories which weave the fabric of intuitive clinical skills. It lives, too, in the sure belief that our former students will, in turn, assume their historic responsibilities as clinical teachers. Examine, for instance, the current ranks of Brown's clinical faculty; while Brown is still a very young medical school, you will nevertheless find scores of Brown medical graduates already fulfilling their responsibilities in this uninterrupted procession of volunteer teaching.

RHODE ISLAND MEDICINE joyously welcomes our 71 new fellow physicians to the profession of medicine. We join with these new colleagues in honoring and expressing thanks to the many practitioners who have been their teachers and guides. And we remind these new physicians, as they assume increasingly grave responsibilities, that they, too, should zealously preserve this unique tradition of training the generations yet to come. Each of us has seen further by standing on the shoulders of our teachers. We ask this new cohort of physicians now to strengthen their shoulders and prepare soon to help the next generation of physicians to see yet further and succeed where they have not succeeded.

Stanley M. Aronson, MD

Chocolate: Pleasure or Pain?

The misuses of mood-altering drugs is a major issue in contemporary society. A report[1] described a potentially worrisome drug effect. Two patients were cured of their craving for chocolate.

Ever since Cortez was served a bitter chocolate drink by Montezuma in 1519 and carried the secret back to Spain innumerable persons have had an insatiable appetite for this substance. Consider the enormous industry supported by those for whom the daily consumption of chocolate is, if not an obsession, at least a compulsive habit. Consider the repercussions if this drug were to become widely used and this peculiar CNS action not appreciated.

Although chocolate was first manufactured in the US in Dorchester in 1765, a certain city in Pennsylvania now is vulnerable to economic collapse if this drug were to exert its effect widely. (Other substances have replaced chocolate as drugs of choice in Dorchester.)

Imagine the possible conspiracy (antitrust laws notwithstanding) between the manufacturers of other sweets (eg, orange slices and mints) to promote this drug quietly for their own base purposes.

Would there be a public outcry as people realized that they no longer derived pleasure from chocolate? Might the effect be so subtle that it would be noticed only by certain brokers on Wall Street, mystified by the precipitous decline in "chocolate stocks?"

What would those of us who generally derive a significant proportion of our daily pleasure from chocolate do with our unsatisfied hedonistic impulses? Some might go into a deep depression or an actual withdrawal state characterized by intense craving and characteristic chocolate seeking behavior such as visiting multiple stores, sacrificing work, sleep and family in the relentless search. There are no data about how many people choose chocolate in preference to sex. Imagine, however, the possible "baby boom" of unknown magnitude and economic consequence.

In the absence of readily available chocolate-induced pleasure, others might abandon their hedonistic, carefree lifestyle and undertake "healthy" but new and potentially dangerous behaviors such as hard work or exercise! These behaviors are likely to prove detrimental physically and emotionally to those people who characteristically have sought to satisfy the pleasure principle in a single minded and monolithic fashion. An indeterminate percentage might even seize the opportunity to try to achieve some insight into their feelings. Unaccustomed as they are to physical exertion, possessed of blood vessels conditioned by years of exposure to milk chocolate and muscles and joints accustomed to no more exertion than unwrapping chocolate bars, these persons may prove to be a boon for cardiologists, cardiac surgeons, orthopedists and psychiatrists among others.

These approaches to compensate for "chocolate loss" might be healthy and productive in the long run but probably would require early and intensive medical and psychiatric care.

Given the magnitude of chocolate craving in our society it is not clear that adequate numbers of qualified doctors unaffected by this malady themselves would be available to meet the demand.

The total cost of appropriate medical care would likely exceed the cost of the original chocolate!

A larger issue concerns other drugs that could alter our daily quest for happiness. Creative pharmacology clearly knows no bounds. What is next on the list? Orange juice? Ice cream? Might we soon see a drug that "cures" people of pleasure from "high cholesterol" foods such as red meat and cheese?

Is the state of our health and the quality of our life up to us? Or are we to be manipulated pharmacologically by unknown masters deciding what balance of health and pleasure is good for us? This type of Orwellian influence is dangerous to our concepts of the value of individual responsibility and freedom of choice.

Admitting a definite personal partiality and bias, I respectfully suggest that this anti-chocolate drug actually may be detrimental to our health and happiness and may increase the cost of medical care.

Herbert Rakatansky, MD

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(Adapted from: Rakatansky H. Chocolate: pleasure or pain? (letter). Am J Psych. *1989;146:1089.)*

To Address a Greater Ill

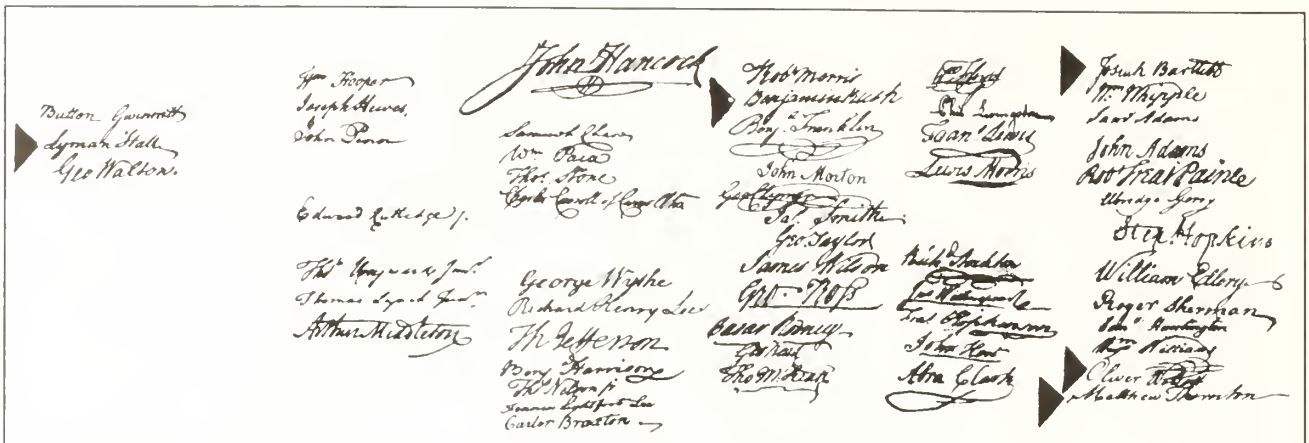
Fifty-six men, ranging in age from 26 to 70 years, placed their signatures upon a one-page document thus pledging their lives, their fortunes and their sacred honor to insure the independence of 13 states of North America. Palsied Stephen Hopkins, representing Rhode Island, stated: "My hand trembles, but my heart does not." A physician representing Pennsylvania, Benjamin Rush, described the signing ceremony in his private journal: "The pensive and awful silence which pervaded the house when we were called up, one after another, to the table of the President of the Congress to subscribe what was believed by many at that time to be our own death warrants."

Fifty-six men, in general congress assembled, subscribed to an eloquent declaration of independence on the fourth day of July in the year 1776. The declaration, written by Thomas Jefferson, was then duly published in the *Pennsylvania Gazette* on July 10, and the original parchment document, ultimately with the immortal 56 signatures, was actually signed on August 10, 1776.

Fifty-six men from 12 colonies, united in resolve, placed their signatures upon this document. Fourteen were lawyers, 12 were jurists, 11 were merchants, 9 were farmers, 5 represented additional vocations—and 5, temporarily forsaking their profession to address a greater ill, were physicians. The names of these five physicians are: Josiah Bartlett of New Hampshire; Lyman Hall of Georgia; Benjamin Rush of Pennsylvania; Matthew Thornton of New Hampshire; and Oliver Wolcott of Connecticut.

Josiah Bartlett was born in Amesbury, Massachusetts in the year 1729. He apprenticed in medicine and at the age of 21 began an extremely successful practice in the village of Kingston, New Hampshire. Although still pursuing a medical career, he nevertheless entered the colonial legislature and was simultaneously a colonel in the militia. Bartlett was elected to the Continental Congress and was a signer of the Declaration. During the ensuing war he was a physician to his state militia. Despite a lack of legal training, Bartlett was then chosen to be New Hampshire's chief justice of the Superior Court and then governor of the state until 1793. Through all of these secular duties, Bartlett never interrupted his practice of medicine. He also was the inaugural president of the New Hampshire Medical Society. Bartlett died in 1794 at the age of 65.

Lyman Hall was born and reared in Wallingford, Connecticut in 1724. He attended Yale in preparation for the clergy but found the ministry not to his liking. In 1752 to began an apprenticeship in medicine establishing his practice in Wallingford. Seeking a better location, Hall joined a group of New Englanders who migrated to South Carolina to establish there a new community. He then transferred to neighboring Georgia where he established a plantation while still practicing some medicine. In 1775 he was chosen to participate in the newly formed Continental Congress. He



Physician-signers of the Declaration of Independence identified by arrow-triangles.

remained enmeshed in congressional duties until 1782 when he returned to Savannah to resume his medical practice while also participating in the state legislature. He was elected governor of Georgia from 1783 to 1784. He died in 1790.

Benjamin Rush was born on Christmas eve, 1745 in the Pennsylvania township of Byberry. He attended the College of New Jersey (later to be called Princeton) and after much reflection, chose medicine as his career. He apprenticed to the eminent Dr John Redman of Philadelphia, for 6 years successively learning the apothecary arts, the rudiments of botany and a variety of basic clinical skills. In August 1766 Rush set sail for Liverpool and thence by road to Scotland for admission to the University of Edinburgh medical school. His studies proceeded well, with the new science of chemistry intriguing him immensely. He successfully defended his thesis in June of 1768 and was awarded a doctorate in physic. He continued his graduate education in London, registering for courses under Dr William Hunter while making regular rounds at St Thomas' Hospital. In London he met and was befriended by Dr John Fothergill and Fothergill's friend, Benjamin Franklin. With money borrowed from Franklin, Rush then traveled to Paris for further graduate studies. In 1769 Rush returned to Philadelphia to commence a hugely successful practice of medicine. He accepted a position at the College of Philadelphia (later to be the University of Pennsylvania) teaching chemistry. The notorious Stamp Act brought Rush into the realm of politics; and his deepening friendships with John Adams, Patrick Henry and Richard Henry Lee carried him into the inner circle of those advocating independence. In June 1776 he was elected to represent Pennsylvania in the Continental Congress where, a month later, he declared his support for independence. During the ensuing war he was, for a short while, the surgeon general to the continental armies in the middle states and he participated actively in the battles of New Jersey. Following the war he resumed his active practice in Philadelphia, taking on large numbers of apprentices while increasing his role as a professor of chemistry and then professor of physic. He died at age 67 during the presidency of James Madison, acknowledged as the leading physician and medical educator of the United States. Some 2,000 physicians had personally trained under his meticulous supervision. His fame endures in Rhode Island since one of the principal pavilions of the state hospital complex in Cranston still bears his name.

Rush, by temperament, was impetuous, argumentative, garrulous, a compulsive letter writer and a relentless zealot in behalf of a variety of causes. He likened himself to the prophet Jeremiah, "a man of strife and a man of contention." From early childhood he was profoundly religious; yet he uniformly opposed the imposition of any religious oath as a requirement for public office. He was an outspoken opponent of slavery and was the first president of the Society for the Abolition of Slavery. (In 1773, he wrote: "Where is the difference between the British senator who attempts to enslave his fellow subjects in America, by imposing taxes upon them contrary to law and justice, and the American patriot who reduces his African brethren to slavery, contrary to justice and humanity?) He fought vigorously against the consumption of alcohol (ardent spirits) and was equally opposed to the use of tobacco, claiming that it was injurious to health. He believed that most diseases were caused by tangible, environmental factors such as crowded housing, lack of personal hygiene, industrial pollution and poor nutrition. He devoted much of his later years to such social issues as the inhumane treatment of psychiatric patients and prison reform. (He utterly opposed capitol punishment. He said: "The punishment of murder by death, is contrary to reason, and to the order and happiness of society. It lessens the horror of taking away human life, and thereby tends to multiply murders.") He regarded himself as a pacifist (a source of considerable irony to the multitude of his enemies) and he even proposed that a Secretary of Peace be established in the federal cabinet.

In the words of a contemporary: "He was endowed with good faculties, a penetrating mind, a ready apprehension, exuberant imagination, and extraordinary memory, and these qualities improved by a long course of unwearying study and observation."

Matthew Thornton was born in Ireland in 1714, migrating with his family at an early age to New England. He apprenticed in medicine, establishing a thriving practice in the New Hampshire town of Derry. He volunteered as surgeon to the colonial militia, participating in the capture of Louisbourg, Nova Scotia. While continuing his practice intermittently, Thornton then began a lengthy career in the state legislature and was chosen to enter the Continental Congress in November of 1776. He was belatedly permitted to sign the Declaration, the last to do so. His signature is seen in the lower right corner of the document. In 1777, despite the lack of any training in the law, he was chosen to be associate justice of the State Superior Court. He died in 1803 at the age of 89.

Oliver Wolcott was born in Windsor, Connecticut in 1726. He graduated from Yale and entered the military. Upon returning from an unsuccessful expedition against New France, he entered the study of medicine but found the practice unproductive and discomforting. He then transferred his studies to the law, holding numerous local offices before representing Connecticut in the Continental Congress. He was absent from Congress in July but was allowed to sign the Declaration in October of 1776, his signature is immediately above Thornton's. Following the Revolutionary War, Wolcott helped to negotiate numerous treaties between the United States and the Iroquois nations as well as the Wyandottes. He was elected governor of Connecticut in 1796, a

position previously held by his father and subsequently held by his son. He died in office at age 71.

Fifty-six men signed the Declaration of Independence, five of them qualified physicians. Some were outstanding physicians, some merely journeymen doctors, and one had abandoned his profession early on. They had each rendered conspicuous political service in behalf of their young nation; but intertwined with these laudable activities, they had also provided invaluable medical service to countless patients, civilian and military.

Stanley M. Aronson, MD

An Exercise of Will

The urge to exercise comes over me sometimes," said Mark Twain, "but I immediately lie down until the feeling goes away." Many Americans continue to share this aversion to physical activity, believing that a life of quiet contemplation ought not be punishable by life-shortening diseases. Exercising one's moral and constitutional rights, say these old believers, is all that should be required for a lengthy and useful existence. But physical inactivity, once a sign of upper class status, has gradually become politically incorrect behavior; indeed it is now lumped with such tainted enterprises as smoking and overeating. The parlor couch, once the emblem of bourgeois stability, has emerged now as a deadly risk factor on a par with saturated fatty acids.

A newer generation grounded from childhood in the virtues of a ritual self-mortification called jogging cannot readily understand an older group which still considers running as something to be undertaken only when confronted by muggers or tidal waves. A jogging grandmother, today, is an icon for healthy living; 50 years ago her behavior would have been looked upon as bizarre or, at the very least, socially embarrassing. Fifty years ago, too, an elderly person walking the streets in sneakers would have been marked as a candidate for podiatric or perhaps even psychiatric evaluation. Jogging, nevertheless, seems to have its limits. The young executive who compulsively jogs will still use his car when visiting the corner grocery store. Walking, at least in the suburbs, has become an obsolete pastime; indeed, in many suburbs sidewalks can no longer be found.

Exercise, for the older physician, was tolerable only when it incorporated some challenge, some element of enhanced neuromuscular coordination such as in golf, or the competitive pressures of squash. Jogging not only seemed pointless, purposeless, repetitive and dull—but without visible goal other than profound exhaustion. Nonetheless, physicians have now adopted new attitudes toward physical activity, filling erstwhile empty corners in their homes with unesthetic instruments of torture called exercise machines. Physicians who had considered jogging an indecorous affront to their professional image, now grimly assign a certain interval of time each day to the resolute act of bicycling in place. Exercise has truly become medicalized; and who knew that this gratuitous movement of the limbs, while only partially answering the body's need, would simultaneously create some new form of addiction?

A recent study published in an April 1995 issue of the *Journal of the American Medical Association*, however, now casts doubt upon the merit of reasonable exercising, noting that a significant extension in life expectancy cannot be realized except in those who regularly undertake vigorous calisthenics. The authors of this study, based their findings upon the activities of 17,300 Harvard alumni, have defined vigorous activity as that which raises oxygen consumption by more than six-fold and results in visible sweating. Apparently the older gymnasium rule, "No gain without pain" is now to be replaced by "No perpetuation without perspiration."

However, a problem arises: How valid, how reliable is this new study? In an era when both the medical profession and the literate public are inundated with inconclusive health studies, when can we confidently believe, and then act upon those beliefs? Clinical epidemiological studies are often plagued by confounding factors, biased samples, inadequate lengths of observation or improperly worded investigative questions. The flood of observations (properly called observations, not conclusions) serve particularly to confuse those who confine their reading to italicized summaries while ignoring the authors' caveats found in the body of the text. Certainly the answer to the question: How much controlled exercise is life-extending? has not been fully answered.

Harry S. Truman, when President, walked the deserted streets of Washington each daybreak. His vigorous daily exertions caused consternation both in the Secret Service and in those who believed that presidents should neither sweat nor appear physically fatigued. And certainly they should not be publicly visible in anything less presidential than a three-piece worsted suit. Since then many presidents have become firm advocates of strenuous, daily exercise — wearing outfits that would raise eyebrows in any place but on jogging paths.

Historians will recall that Coolidge, in 1927, announced "I do not choose to run . . ." But presidents, and candidates for the presidency, nonetheless jog readily in public, accompanied each day by appropriate security and publicity personnel. For those who govern, this newer form of exercise has merely added to, rather than supplanted, their more conventional athletic activities: wrestling with their consciences, jumping to conclusions and, when confronted, exercising utter caution.

Stanley M. Aronson, MD

Necrology 1994 Addendum

Irene G. Maynard, MD

Irene G. Maynard, MD, 80, of Whitman Road, Coventry, a general practitioner in West Warwick for 20 years and a psychiatrist for 7 years at the Veterans Administration Hospital in Providence, retiring in 1973, died September 22, 1994 at Kent County Memorial Hospital. She was the wife of Jean M. Maynard, MD. Born in Brockton, Mass., a daughter of the late Edouard and Olivine (Burdeau) Grandmont, she lived in West Warwick for 28 years before moving to Coventry 22 years ago.

Dr Maynard graduated from Brockton High School in 1932 and received her bachelor's degree from Jackson College of Tufts University in 1936. She received her medical degree from Boston University in 1940. She interned at St Mary's General Hospital, Lewiston, Maine, and did her residency in psychiatry at Foxboro State Hospital. She worked for the US Public Health Service from 1944 to 1946. She ran a general practice in West Warwick from 1946 to 1966. From 1966 to 1973 she practiced medicine in the psychiatric department of the Veterans Administration Hospital.

Dr Maynard served in the Coast Guard with the SPARS. She was a charter member of the medical staff at Kent County Memorial Hospital, and a member of the American Medical Association, the Rhode Island and Kent Medical Societies. She was a former member of the Quota Club. She was a communicant of St Vincent dePaul Church. She volunteered with the Boy Scouts and Girl Scouts of America.

Besides her husband, she leaves two daughters, Jeanne Darling of Basel, Switzerland,and Aline Maynard of New York City; two sons, Denis Maynard of Juniata, Neb., and Maurice Maynard of Cranston; two sisters, Lorraine Rice of Lubbock, Texas, and Doris Igo of Springfield, VA.; a brother Edward Grandmont of East Bridgeewater, Mass.; and eight grandchildren.

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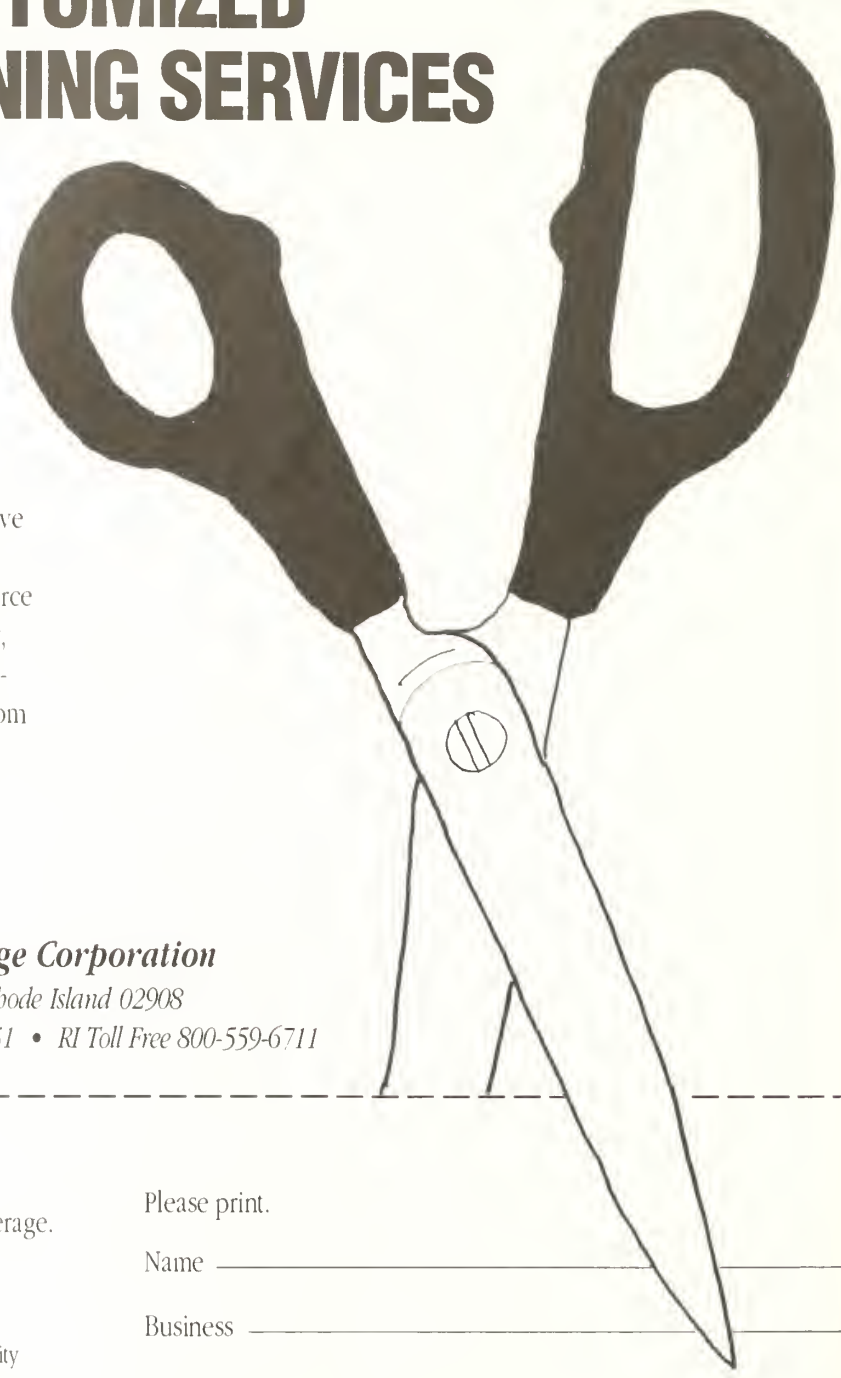

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The Brown University School of Medicine Class of 1995

Stephen R. Smith, MD

More than half of the graduates have entered training in primary care specialties, though many will probably specialize, especially those selecting categorical programs in internal medicine.

On May 29, 1995, 71 men and women received the Doctor of Medicine degree from Brown University, representing its 21st class of physicians this century. If this class follows the pattern of preceding classes, approximately 14% eventually will enter the practice of medicine in the Rhode Island. Of the 1,417 physician graduates of previous classes, approximately 200 (14%) are currently licensed to practice in Rhode Island.

The purpose of this article is to introduce the graduates of the MD Class of 1995 to the physician community in Rhode Island, since many will be our future professional colleagues.

A Portrait of the Class of '95

Thirty-five graduates were men (49%) and 36 were women (51%). The racial/ethnic composition of the class, as shown in Table 1, shows a continuation from the previous year in the proportion of students from Asian-American backgrounds (35%), the same as the previous class, and up from 18% in the Class of 1993. This trend was predicted and will stabilize at the present level, since about half of the students in the first 4 undergraduate years of the 8-year Program in Liberal Medical Education (PLME) are Asian-American. Only 3% of the graduates are members of minority groups underrepresented in medicine (2 African-Americans) as defined by the Association of American Medical Colleges (AAMC). This number is disappointingly low, but should rise in future years based on more successful recruiting of underrepresented minority students in the PLME. For the past three years, about 20% of freshmen college PLME students have been from underrepresented minority groups. The percentage of underrepresented minority students in the first 3 years of the medical school is 10.3%.

Slightly less than one-fifth of the class (13 graduates) are residents of Rhode Island. The Rhode Island students in this year's graduating class came from nine different communities in the state, with four from Cranston, two from Warwick, and one each from Barrington, Johnston, Newport, North Providence, Providence, Tiverton, and Woonsocket. The high schools from which the students graduated generally reflects this diversity, with three students having attended Bishop Hendricken, two others Cranston East High School, and the rest having come from nine other high schools.

Table 1.—Demographic Characteristics of the MD Graduates of the Brown University School of Medicine Class of 1995

	No.	Percent
Sex		
Male	35	49.3
Female	36	50.7
Race		
White	44	62.0
Asian	25	35.2
African American	2	2.8
State of Residence		
Rhode Island	13	18.3
New York	13	18.3
California	10	14.1
New Jersey	10	14.1
Pennsylvania	4	5.6
Connecticut	3	4.2
Maryland	3	4.2
Massachusetts	3	4.2
New Hampshire	3	4.2
Missouri	2	2.8
Other States	6	8.5
Other Countries	1	1.4

The MD Class of 1995 reflects the growing proportion of students from the PLME, with 37 such graduates *(52%)* having come through that route. The second largest cohort of students (16 graduates) came through the combined Brown-Dartmouth Medical Education Program in which students spend their first 2 years of medical school at Dartmouth, then transfer to Brown for the final 2 years and are awarded Brown MD degrees.

The medical school entered into special agreements with several postbaccalaureate premedical programs (Brown University, Bryn Mawr College, and Columbia University) shortly after the PLME was inaugurated. Students from these programs decided upon a career in medicine only after completing college. Typically, they have been engaged in other careers for several years following college. The goals in establishing this new route of admission were to maintain a rich diversity in the student body by admitting students who were older and who had different academic and life experiences as well as rounding out the total class size to compensate for the expected attrition from the PLME.

Postbaccalaureate students represented 21% of the graduates. Of the 15 postbaccalaureate students, one came from Brown and 7 each came from Bryn Mawr College and Columbia University.

Among the remainder of the class, one student was part of the Early Identification Program (EIP) at Providence College. EIP students are offered provisional admission to the medical school during their sophomore year at their respective undergraduate colleges. Finally, the remaining two graduates were an MD/PhD student and an advanced transfer student.

Brown University was the most common undergraduate college among the graduates accounting for 37 graduates (52%). The University of Pennsylvania ranked second with four members of the Class of 1995 having that school as their alma mater. Altogether, the graduates of the Class of 1995 came from 27 different colleges and universities.

The most common undergraduate major among the class members was biology (including subdisciplines such as genetics, neural sciences, molecular biology, etc.), with 35% the class selecting that as their undergraduate field of study. Science majors taken together (including psychology) accounted for 68% of all majors, while 14% majored in the humanities, and 18% majored in the social sciences. Among the humanities majors, bioethics was the most common choice, while economics was the most popular choice among those majoring in the social sciences. The selection of ma-

ABBREVIATIONS USED:
AAMC: Association of American Medical Colleges
EIP: Early Identification Program
PLME: Program in Liberal Medical Education

Stephen R. Smith, MD, is associate dean for medical education and professor of family medicine with the Brown University School of Medicine, Providence, Rhode Island.

Table 2.—Specialty Choices of the MD Graduates of the Brown University School of Medicine Classes of 1991-95

	Graduating Class									
	1991		1992		1993		1994		1995	
Specialty Choice	No.	(%)	No.	(%)	No.	(%)	No.	(%)	No.	(%)
Primary Care, total	37	(49.3)	49	(64.5)	39	(54.2)	44	(58.7)	41	(58.6)
Internal Medicine, total	15	(20.0)	22	(28.9)	20	(27.8)	23	(30.7)	18	(25.7)
Categorical Medicine	13	(17.3)	16	(21.1)	16	(22.2)	20	(26.7)	15	(21.4)
Primary Care Medicine	2	(2.7)	6	(7.9)	4	(5.6)	3	(4.0)	3	(4.3)
Pediatrics	10	(13.3)	11	(14.5)	4	(5.6)	10	(13.3)	14	(20.0)
Family Medicine	4	(5.3)	10	(13.2)	9	(12.5)	6	(8.0)	4	(5.7)
Medicine/Pediatrics	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Obstetrics & Gynecology	8	(10.7)	6	(7.9)	6	(8.3)	5	(6.7)	5	(7.1)
Surgery	9	(12.0)	2	(2.6)	2	(2.8)	7	(9.3)	7	(10.0)
Surgical Subspecialties, total	6	(8.0)	9	(11.8)	10	(13.9)	8	(10.7)	9	(12.9)
Ophthalmology	3	(4.0)	6	(7.9)	2	(2.8)	2	(2.7)	3	(4.3)
Orthopedics	2	(2.7)	1	(1.3)	3	(4.2)	4	(5.3)	3	(4.3)
Neurosurgery	0	(0.0)	1	(1.3)	1	(1.4)	0	(0.0)	0	(0.0)
Urology	1	(1.3)	0	(0.0)	2	(2.8)	1	(1.3)	3	(4.3)
Plastic Surgery	0	(0.0)	0	(0.0)	1	(1.4)	0	(0.0)	0	(0.0)
Otorhinolaryngology	1	(1.3)	1	(1.3)	1	(1.4)	1	(1.3)	0	(0.0)
Emergency Medicine	3	(4.0)	3	(3.9)	2	(2.8)	1	(1.3)	0	(0.0)
Psychiatry	2	(2.7)	4	(5.3)	3	(4.2)	7	(9.3)	3	(4.3)
Neurology	2	(2.7)	3	(3.9)	3	(4.2)	1	(1.3)	2	(2.9)
Transitional	3	(4.0)	1	(1.3)	8	(11.1)	3	(4.0)	0	(0.0)
Institutional Specialties, total	10	(13.3)	5	(6.6)	5	(6.9)	4	(5.3)	8	(11.4)
Anesthesiology	1	(1.3)	1	(1.3)	2	(2.8)	0	(0.0)	3	(4.3)
Pathology	1	(1.3)	2	(2.6)	1	(1.4)	0	(0.0)	0	(0.0)
Rehabilitation Medicine	1	(1.3)	1	(1.3)	1	(1.4)	1	(1.3)	1	(1.4)
Radiology and Radiation Oncology	7	(9.3)	1	(1.3)	1	(1.4)	3	(4.0)	4	(5.7)
Totals*	75	(99.9)	76	(99.8)	72	(100.0)	75	(99.9)	70	(100.1)

*Excludes those not entering residency training in the same year of graduation. Totals do not add to 100.0 due to rounding

jor among the graduates represents a continuing trend toward a broader range of undergraduate majors, reflecting the larger proportion of postbaccalaureate and PLME students in this class. The postbaccalaureate and PLME students were less likely to be science majors than were traditional premedical students.

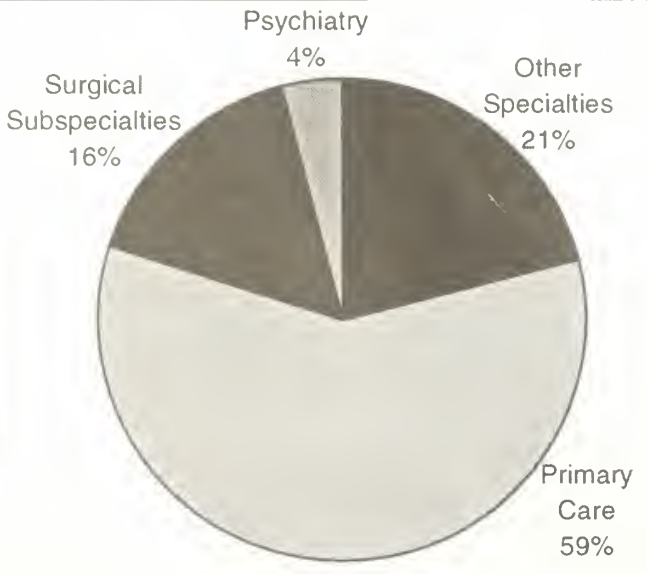

Fig 1.—Specialty choices of the Brown University School of Medicine Class of 1995.

Where They Are Going

Internal medicine remains the most frequently selected specialty. The proportion of the graduates entering internal medicine is slightly lower than last year. The proportion of graduates choosing internal medicine seems to have plateaued in the range of 25% to 30%, as shown in Table 2.

The proportion of the class entering specialties in primary care remains a little over half of the class. This includes the fields of internal medicine, pediatrics, family practice, and obstetrics and gynecology. The proportion of the class going into pediatrics was higher than usual, while the proportion going into family medicine was lower than usual. Figure 1 illustrates the specialty choices of the Class of 1995.

The actual number of graduates who will eventually practice primary care after completing their graduate medical education training will be smaller than the 59% reported here, if the past is any indication. An analysis of longitudinal data collected by

Table 3.—State in Which the First Year of Residency Training is Located for the Brown School of Medicine MD Class of 1995

State	No.	(%)
Arizona	1	(1.4)
California	11	(15.7)
Connecticut	2	(2.9)
Colorado	1	(1.4)
District of Columbia	2	(2.9)
Hawaii	1	(1.4)
Illinois	2	(2.9)
Louisiana	1	(1.4)
Maine	2	(2.9)
Maryland	4	(5.7)
Massachusetts	10	(14.3)
Michigan	1	(1.4)
Minnesota	1	(1.4)
New Jersey	1	(1.4)
New York	11	(15.7)
North Carolina	1	(1.4)
Pennsylvania	2	(2.9)
Rhode Island	11	(15.7)
Texas	1	(1.4)
Virginia	2	(2.9)
Washington	2	(2.9)
Total	**70**	**(100.0)**

the AAMC of the graduates of the classes of 1987-1990 reveals that over half of the graduates who enter residency programs in internal medicine end up in a subspecialty of internal medicine, such as cardiology. Likewise, about a quarter of those entering residency training in pediatrics will do likewise. Among the primary care residencies, only family practice does not exhibit this pattern. Actually, the number of graduates in those four classes who eventually enter family practice is *greater* than those who started out that way by about 13%. Overall, about two-thirds of graduates who enter primary care residencies will eventually enter practice in primary care. Applied to this class, about 28 graduates (40%) will actually practice in primary care. The changing climate in health care delivery might increase that number, as graduates recognize that job opportunities in subspecialty medicine become harder to find.

A similar trend is seen at the national level. For the first time in 7 years, more than 50% of US medical school seniors will pursue training in internal medicine, pediatrics, and family practice, according to the AAMC.[1] (The AAMC does not include obstetrics and gynecology among the primary care specialties.) The number of US medical school seniors who will pursue training in family practice now totals 2,081, making them the largest group of first-year family practice residents in the 43-year history of the National Resident Matching Program. They constitute 15.4% of all matched US seniors.

US seniors entering first-year internal medicine residencies will number 3,322, or 24.5%. In pediatrics, the numbers are 1,502 and 11.1% respectively.

Table 4 lists the Class of 1995 graduates and where they will be going to do their residency training. Of the 70 graduates who will enter residency training next year (one is delaying her residency for 1 year), 11 graduates (16%) matched with Brown-affiliated residency programs and will be staying in the state. Next to Providence, Boston and New York City attracted the most members of the Class of 1995 for their first year of training (8 graduates each), with the Stanford University area next with three graduates going there for their first year of residency training.

California and New York State will be the homes for 11 graduates each next year and equal Rhode Island as the most popular states for residency training. Table 3 lists those states where the graduates will be going for their first year of residency training. As with preceding classes, this class overwhelmingly preferred the Northeast and West Coast to the South and Central states. Almost two thirds will be spending their first year of residency in the Northeast and nearly one quarter on the West Coast. Four students (6%) will be in the Midwest, and five students (7%) chose to go to the South.

Conclusion

The pattern of career choice of the MD Class of 1995 does not show any startling changes from previous years. Over half of the graduates have entered training in primary care specialties, though many will probably subspecialize, especially those selecting categorical programs in internal medicine. The large increase in general surgery is also encouraging. Though general surgery is not a primary care specialty, a shortage of general surgeons also exists, particularly in smaller communities. Psychiatry, another undersubscribed specialty nationally, dropped in attractiveness among Brown graduates this year after rising in the last few years. After a 1-year fall, the proportion of graduates selecting residency training in the surgical subspecialties has again risen. The institutional specialties also posted an increase, bucking a national trend.

The only clear trend revealed by a plot of 3-year moving averages is the growing popularity of surgical subspecialties among Brown graduates. This is rather paradoxical given the widespread belief that our nation already has an excess of surgical subspecialists and Brown's reputation for promoting primary care. However, Brown has also been able to recruit a very talented student body who are capable of competing successfully for even the most sought after residency positions. Among the graduates of the Class of 1995, 100% of those applying for residencies in ophthalmology, orthopedics, and urology were successful, despite the reputation of those subspecialties as difficult to enter.

Despite this rather puzzling trend, Brown medical school continues to strive to provide excellent training and strong encouragement for those who seek careers in primary care as described by Scott elsewhere in this edition of RHODE ISLAND MEDICINE.

Acknowledgments: My thanks to Alexandra Morang and Janice Viticonte in the Office of Medical Student Affairs, Brown University School of Medicine for assistance in summarizing the data.

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1. Match day yields largest group of family practice residents in history. *AAMC Reporter.* 1995;4: 4.

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Table 4.—Brown University School Of Medicine Class Of 1995 Residency Positions

Name of Graduate	Hospital Name/Medical School Affiliation	Specialty
Preetha Basaviah	Beth Israel Hospital/Harvard Medical School	Internal Medicine
Steven Bernstein	University of Maryland/Univ. of Maryland	Orthopaedics
Catherine Birndoff	The New York Hospital/Cornell University	Psychiatry
Thomas Boeker	Univ. of North Carolina Hospital/Univ. of North Carolina	Psychiatry
William Boyd	Beth Israel Hospital/Harvard Medical School	Internal Medicine
Lisa Boyle	Women & Infants Hospital/Brown University	Obstetrics/Gynecology
Chris Breen	Mayo Grad School of Medicine/Mayo Medical School	Orthopaedics
Barbara Burke	Maine Medical Center/University of Vermont	Surgery
Atul Butte	Children's Hospital-Boston/Harvard Medical School	Pediatrics
Jayson Carr	David Grant US Air Force Medical Center, Calif.	Internal Medicine
Pakhi Chaudhuri	University of Washington Affiliated/Univ. of Washington	Pediatrics
Edward Chen	UMDNJ-Robert W. Johnson/UMDNJ-RW Johnson Medical	Internal Medicine-Prelim
	New York Hospital/Cornell University	Anesthesiology
Jack Chen	Stanford University Hospital/Stanford University	Internal Medicine-Prelim
	UCLA Medical Center/UCLA School of Medicine	Radiology-Diagnostic
Frank Chiu	California Pacific Medical Center/Univ. Calif.-SF	Internal Medicine
Hyun Kee Chung	Loyola University Medical Center/Loyola University	Surgery-Prelim
Boris Chusid	Lenox Hill Hospital/New York University	Internal Medicine
Ailis Clyne	Rhode Island Hospital/Brown University	Pediatrics

Table 4.—Brown University School Of Medicine Class Of 1995 Residency Positions, continued

Name of Graduate	Hospital Name/Medical School Affiliation	Specialty
Triste Coulombe	Maine Medical Center/University of Vermont	Obstetrics/Gynecology
Margaret Dean	Duke University Medical Center/Duke Univ. Med. Ctr.	Psychiatry
Phu Do	Boston University School of Medicine/Boston University	Surgery
Jeremy Erdley	Cedars-Sinai Medical Center/UCLA School of Medicine	Pediatrics
Todd Everett	Roger Williams Hospital/Brown University	Internal Medicine-Prelim
	Stonybrook Teaching Hospitals/SUNY-Stony Brook	Radiofogy-Diagnostic
Sara Fazio	Beth Israel Hospital/Harvard Medical School	Internal Medicine
Brenda Fiss	Mt. Sinai Hospital/Mt. Sinai School of Medicine	Obstetrics/Gynecology
Mary Gartner	Women & Infants Hospital/Brown University	Obstetrics/Gynecology
Joan Greenburg	Miriam Hospital/Brown University	Internal Medicine-Prelim
	Brigham & Women's Hospital/Harvard Medical School	Anesthesiology
Fred Hsieh	Johns Hopkins Hospital/Johns Hopkins Medical School	Internal Medicine
Chunfea Amy Hsu	North Shore University Hospital/Cornell University	Internal Medicine-Prelim
	University of Washington Affiliated/Univ. of Washington	Physical Med & Rehab
Katherine Hsu	Presbyterian Hospital/Columbia University	Pediatrics
Sigmund Hsu	Hospital of St. Raphael/Yale University	Internal Medicine-Prelim
	New York Hospital/Cornell University	Neurology
Lynn Iler	Yale-New Haven Hospital/Yale University	Medicine-Primary
Jenny Kim	Stanislaus Medical Center/Univ. of Calif., Davis	Family Practice
Daniel Labow	The University of Chicago Hospitals/Univ. of Chicago	Surgery
Steven Lee	Rhode Island Hospital/Brown University	Internal Medicine
Edmun Leo	Children's Hospital/Univ. Calif., San Francisco	Pediatrics
Odalys Machin	University of Massachusetts/Univ. of Massachusetts	Internal Medicine
Eve Makoff	Cedars Sinai Medical Center/UCLA School of Medicine	Internal Medicine
Robert Marcovich	University of Michigan Hospitals/University of Michigan	Urology
Melissa McCormack	Childrens Hospital/University of Pennsylvania	Pediatrics
Simon McRae	Stanford University Medical Center/Stanford University	Urology
Daniel Miga	Univ. of Colorado School of Medicine/Univ. of Colorado	Pediarics
Mark Miller	Portsmouth Naval Hospital/Portsmouth, VA	Internal Medicine
Srilata Naidu	New England Deaconess/Harvard Medical School	Internal Medicine—Prelim
	New York University Hospital/New York University	Ophthalmology
Ximena Paez	LSU School of Medicine-New Orleans/LSU School of Med.	Internal Medicine-Prelim
	LSU Eye Center/LSU School of Medicine	Ophthalmology
Sufala Patil	University of Hawaii/University of Hawaii	Transitional
	Beth Israel Hospital/Harvard Medical School	Radiology-Diagnostic
Joseph Patruno	Hershey-Penn. State/Pennsylvania State	Obstetrics/Gynecology
John Pezzullo	Roger Williams Hospital/Brown University	Internal Medicine-Prelim
	Rhode Island Hospital/Brown University	Radiology-Diagnostic
Thai Pham	Baystate Medical Center/Tufts University	Internal Medicine
Mark Polhemus	Walter Reed Army Medical Center, Washington, DC	Internal Medicine
Tal Raviv	Winthrop University Hospital/SUNY-Stony Brook	Internal Medicine-Prelim
	New York Eye & Ear Infirmary/New York University	Ophthalmology
Staci Resnick	New England Medical Center/Tufts University	Pediatrics
Corwin Robertson	Einstein Affiliated Hospitals/Albert Einstein	Medicine-Primary
Michael Roh	Presbyterian Hospital/Columbia University	Orthopaedics
Joshua Rotenberg	Lenox Hill Hospital/New York University	Internal Medicine-Prelim
	Columbia Presbyterian Hospital/Columbia University	Neurology
John Sabra	Univ. of Texas SW Medical School/Univ of Texas SW-Dallas	Surgery
Renu Sharaf	Delaying Residency	
Veronica Shim	University of Arizona Affiliated Hospital/Univ. of Arizona	Surgery
Viraj Shroff	Mt. Sinai Hospital/Mt. Sinai School of Medicine	Internal Medicine
Jonathan Siegel	Albany Medical Center Hospital/Albany Medical College	Family Practice
Elaine Stanek	Portsmouth Naval Hospital, Portsmouth, VA	Pediatrics
Elizabeth Stuart	Stanford University Hospital/Stanford University	Pediatrics
Kima Taylor	Georgetown University Hospital/Georgetown University	Pediatrics
Annie Tewel	University of Maryland-Baltimore/University of Maryland	Surgery
Shannon Thyne	University of California/Univ. of Calif-SF	Pediatrics-Primary Care
Jennifer Ting	Roger Williams Hospital/Brown University	Internal Medicine-Prelim
	University of California/Univ. of Calif-SF	Anesthesia
Beth Toolan	Rhode Island Hospital/Brown University	Pediatrics
David Turner	Tacoma Family Medical/University of Washington	Family Practice
Stina Wedlock	Rhode Island Hospital/Brown University	Medicine-Primary
Joanne Wilkinson	Memorial Hospital/Brown University	Family Practice
Justina Wu	Beth Israel Hospital/Harvard University	Internal Medicine
Jason Zommick	LAS-USC Medical Center/Univ. Southern California	Urology

Primary Care Development at Brown University School of Medicine

H. Denman Scott, MD

. . . primary care is like a single coin: one side is clinical and oriented to the problems of individual patients; the other is community -based and oriented to the problems of populations.

Primary care is important but so is specialty care. Our problem in the United States is how to achieve a better balance between the underpopulated primary care disciplines and the overpopulated subspecialty disciplines. We need to recruit more of our medical students into primary care and fewer into the specialties. This is a goal of the Brown University School of Medicine.

Primary Care Defined

Primary care medicine is a rich, complex enterprise. At the beginning of the 1994 academic year I tried to explain primary care in concrete terms to the first-year students as follows:

- "Will you be my doctor?" If you, as a new physician, respond affirmatively to this question, you will have entered into an agreement to attend to all that person's health care needs for a prolonged period of time. Once you have said yes to about 2,000 individuals, you will have become a busy primary care physician. Some physicians will confine their practice to children, some to women, some to adults, some to the very old, and others to a mix of age and gender. But all will have entered into a continuing, mutually rewarding, long term relationship.
- You will want to advise your patients how to stay well and avoid premature illness or injury. You will evaluate complaints, make diagnoses, carry out treatments, arrange consultations. For patients with complex and multiple problems you will work with a team—various specialty colleagues, nurses, and other health professionals—to coordinate appropriate care and support. You will manage and synthesize large quantities of information that originate from many sources of care. You will come to know these people intimately, and they will come to know you and trust you in very special ways. In summary, the care you provide will be continuous, comprehensive and coordinated; and you will accumulate many grateful people who respect and value your role in their lives.
- In addition to clinical duties to individual patients, primary care physicians are expected to understand the health profiles and health needs of communities. Caring for a pregnant 17-year-old girl who is panicked about HIV infection is a special clinical challenge. But just focusing on her problems is not enough. Primary care physicians must also consider questions such as, how widespread is the problem of teenage pregnancy? How prevalent is HIV infection? And how can such problems be prevented?

Primary care is like a single coin: one side is clinical and oriented to the problems of individual patients; the other is community based and oriented to the problems of populations. This latter side will become more important and receive more attention because of our increasing emphasis on prevention and because of the emergence of managed care as the dominate mode of medical practice. Managed care in its best forms must examine the characteristics and potential medical needs of an enrolled population: how many births are likely in a year, how many women should be screened for breast cancer, and how many diabetics will require monitoring?

Research and Primary Care

Brown has a distinguished record in research which bears directly or indirectly on primary care. Faculty investigators have led studies related to the prevention of chronic disease, to the problems of aging, to the problems related to alcohol and drug use, to clinical and behavioral aspects of HIV infection. Other lines of investigation will involve the epidemiology of health care quality, the improvement of clinical outcomes, and the development of measures which can describe in quantitative terms the attributes of primary care: accessibility, continuity, comprehensiveness, coordination, and accountability.

To improve our effectiveness in research, the medical school is currently considering plans that will enable investigators, now at many different locations, to work together at a common site for a significant fraction of their time. It is our sense that regular interaction can promote new ideas and collaborations which are hard to engender when faculty are located exclusively at one place.

Role of the Associate Dean for Primary Care

With the creation of the office of the associate dean for primary care the medical school has set the following goals to strengthen teaching and research in primary care.:

1. To create a stronger and more credible presence in the medical curriculum;
2. To promote the integration of teaching and research among the primary care disciplines. These include family medicine, general internal medicine, obstetrics and gynecology, and general pediatrics. Integration is important because it can build a critical mass of effort and presence in a medical school dominated by subspecialty faculty. It also emphasizes the common themes of accessibility, continuity, and comprehensiveness, which all the primary care disciplines share as important aspirations and indicators of excellence;
3. To find and develop primary care role models for medical students and residents; and
4. To develop a model teaching ambulatory practice which would ideally involve several of the primary care disciplines. Progress towards these goals will create a climate at Brown that should recruit a higher proportion of our graduates into one of the primary care disciplines.

Duringmy first months as associate dean for primary care, I have met with scores of individuals at hospitals, health centers, HMOs and insurance plans. I have learned much and have sought guidance in how to achieve our goals in primary care. Several important things have occurred that relate to the stated goals.

Enhanced Curriculum in Primary Care

One of the most important commitments was the requirement for a 6-week family medicine clerkship in the third year and to change the medicine clerkship from a 12-week inpatient experience to 8 weeks of inpatient work and 4 weeks of ambulatory internal medicine. Unfortunately, this ap-

ABBREVIATIONS USED
H IV: Human immunodeficiency virus
HMO: Health maintenance organization

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proach, while enhancing the primary care presence, fragments the community health clerkship, and splits this activity between family medicine and ambulatory internal medicine time. This model also does not promote joint teaching between general internal medicine and family medicine faculty, and therefore does not lead us to the goal of faculty integration. As the new curriculum begins in July 1995, it will be important to evaluate its effectiveness.

Integration Among Disciplines

Progress towards collaboration of primary care faculty is beginning to occur. The family practice and general internal medicine programs at Memorial Hospital are committed to working jointly to the extent possible. The opportunities for this collaboration are greatly enhanced by the recent joint statement encouraging such activity by the American Boards of Family Practice and Internal Medicine.[1] General internist faculty at Rhode Island Hospital have expressed interest in working with family practice faculty in curriculum development for the third-year clerkship. General internists with research interests are coming together from three hospital settings (Memorial Hospital of Rhode Island, Rhode Island Hospital, and the Veterans Administration Medical Center) and are meeting regularly with research fellows based at Rhode Island Hospital. These are all promising developments but much remains to be done.

Primary Care Role Models

Our community has many outstanding practicing primary care physicians. Most work in solo or small group practices; some in staff model HMOs. While many are involved in teaching medical students and residents, often with positive feedback from the trainees, there has been no systematic formulation of teaching objectives or evaluation of the educational result. Most experience is: "what you get is what you see." The community health clerkship has done the most in this area, and the faculty has provided the school with a good base upon which to build in the new curriculum structure. From this mix of talent we should seek several key physicians who would be willing to devote additional time to teaching and thereby become outstanding role models in primary care to a much larger fraction of medical students. To make this happen will require academic recognition and reasonable compensation for the extra time devoted to teaching.

Model Practice Sites

With the rapid emergence of managed care it is important that students and residents understand what this organizational revolution is about and learn to operate within this environment. Specifically, education must begin to focus not only on the content of clinical medicine, but also how to practice in an efficient manner and how to practice under capitated systems of reimbursement. To do this will require new attitudes and skills on the part of faculty and other staff. In particular everyone will need to understand and use W. Edward Deming's system of continuous quality improvement.[2] Continuous improvement focuses on defining and achieving goals. It recognizes that the processes designed to achieve the goals must undergo continuous review and modification in order to meet and ultimately improve upon specific objectives. When organizations, including health care organizations, persist with his system, it has very salutary effects on outcomes and efficiency.

Community health centers, private offices, hospital clinics, the Family Practice Center at Memorial Hospital, the General Internal Medicine clinics at Rhode Island Hospital and the health centers of the Harvard Community Health Plan have all played valuable roles in teaching ambulatory medicine over the past years. These settings will continue to be important, particularly those that can incorporate the educational goals related to the environment of medical practice. However, we must also develop new practice arrangements that bring together full time (mostly teaching and research) and volunteer (mostly practice, some teaching) faculty who can operate successfully in a managed care environment. The shape of such an endeavor and its creation will require careful study and wide consultation.

Other activities not directly related to the four goals have added to the sense of importance afforded primary care at Brown. These include participation in the first national Primary Care Day on Sept. 29, 1994. An excellent program, largely conceived and organized by medical students, was well received. Released on the same day was the first *Guide to Primary Care* at Brown which provided a comprehensive list of projects and faculty to whom the students with an interest in primary care could turn.

A Clinical Base

Moving from a broad mandate in education, research, and practice development, which in its initial formulation is highly abstract, to practical programmatic development is the major challenge for this office. To move forward, the campus-based dean must formulate plans, convene appropriate individuals to review, modify and endorse the plans, and finally seek support from key executives in several settings to implement the plans.

In evaluating the progress under the above modus operandi, I have concluded there are major limitations to this approach. First, the dean is remote from daily clinical action. There is insufficient opportunity to get to know primary care faculty, residents, and students and insufficient opportunity to achieve a detailed understanding of the problems related to curriculum, research, and faculty development. Second, being remote also makes it more difficult to establish significant credibility with those whom you will be dependent upon to implement and sustain reform in primary care. Third, the position of associate dean is largely advisory and is without programmatic or budgetary authority. While much can be done with advice and persuasion, some budget and program authority is very useful in moving things forward. To deal with these problems, the duties of the associate dean need to include a clinical component. With my appointment as physician-in-chief at Memorial Hospital, the Office of Primary Care has established a clinical base. Memorial Hospital is a logical base because the institution has focused its energies on training excellent general physicians with emphasis on health promotion, disease prevention and comprehensive primary care.

The clinical base at Memorial Hospital will be used to convene faculty and integrate with the primary care activities at the other Brown hospitals and clinical settings. Such an arrangement will expedite the development of integrated residencies such as primary care internal medicine, which is an expressed goal of the medical school. My base at Memorial Hospital will not preclude assignment of leadership positions in primary care to faculty at other hospitals, eg, residency program directors; indeed I will look for such opportunities. There are exciting and stressful times ahead. With them will come opportunities for improving care of individuals and for improving the health of the community as a whole.

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The Program in Liberal Medical Education: A Look at the First 10 Years

Julianne Ip, MD

The future physician will be practicing in an era overwhelmed with facts, new technologies and a changing health care system. Also, students will have to confront ethical issues that no one would have dreamed possible years ago.

When Dean Stephen Smith asked me to write an article for the Rhode Island Medicine reviewing the first 10 years of the Program in Liberal Medical Education (PLME), my first thought was "I don't write articles ... I see patients" As usual, however, he prevailed because, upon reflection, I interact with students also. It is the students that make this program unique and it is a privilege to be a part of their lives and therefore to share what I can about them.

As a way of introducing a retrospective overview on Brown's PLME, listed below are several short vignettes that illustrate what some of our students have done with their education. Each of these students has taken advantage of one or another of the unique aspects of the PLME.

PLME student D.E. was involved in clinical research during the summers of his undergraduate years. He prepared three papers, including one in which he was lead author. D.E. was invited to present the paper at the 52nd annual meeting of the Society of University Surgeons. He completed the PLME, receiving the Henry Randall award as the senior medical student with a superior performance in surgery. D.E. was accepted into the surgery residency at Johns Hopkins where he plans to pursue his career in trauma surgery.

PLME student J.R. completed independent study in his area of concentration which was history. He presented his undergraduate research on the socioeconomic and scientific impact of mid-19th century approaches to the treatment of tuberculosis at the annual meeting of the American Association for the History of Medicine. J.R.'s paper was the winner of a national competition for students in the history of medicine. Continuing his interest in the history of medicine, with an additional focus now on the history of psychiatry and neurology, J.R. then prepared a paper on the work of American neuroscientist Richard Sperry for which J.R. was awarded the American Academy of Neurology's Roland P. Mackay Award for best essay on the history of neuropsychiatry by a medical student. J.R. completed the PLME and is now engaged in a residency in Psychiatry at University of Pittsburgh.

PLME students S.P. and A.M. spent their junior year abroad in India. They were interested initially in seeking out their roots. While there, they discovered far more than they had imagined They faced death. They confronted challenges of hunger and bubonic plague in their daily living, and also dealt with issues of human rights, particularly women's rights. They returned as changed individuals with new perspectives. They had to deal with the culture shock, not only of having been away, but also of coming home. Both are concentrators in public policy, and are presently more than ever committed to public policy and international health.

PLME student M.S. completed her first four years of the PLME with a concentration in English and Comparative Literature graduating magna cum laude. She was awarded the Peter and Babette Stewart award as the PLME senior student who best exemplified the goals of the PLME. M.S. then took a break from the eight year medical education continuum to attend the Columbia University School of Journalism. While at Columbia she earned special recognition for excellence in science journalism and was awarded the Wade Doares Prize and the John M. Patterson Prize as the school's top student in broadcast journalism. M.S. then resumed medical school. She was able to continue her interests in medical journalism by writing for Lifetime and doing stories for other television stations. M.S. is currently a resident in Internal Medicine at Johns Hopkins Hospital.

PLME student J.O. came to Brown and decided to spend his junior year abroad to study at Kings College in London. He had always been interested in biology, having spent his summers teaching molecular biology at Cold Spring Harbor, but his semester abroad energized him. J.O. decided to pursue a M.D./Ph.D. program at Brown. He is currently completing his Ph.D. and will then return to medical school.

These and other students like them comprise the Program in Liberal Medical Education.

What is the mission of the PLME? In the early 1980's, a report was published challenging educators of the physicians of the 21 st century to meet the charge of training physicians to be life-long learners. The future physician will be practicing in an era overwhelmed with facts, new technologies and a changing health care delivery system. Additionally, students will have to confront ethical issues that no one would have dreamed possible years ago. The Brown University School of Medicine faculty, under the leadership of Dean David Greer, crafted the Program in Liberal Medical Education. Designed to remove the artificial barrier between the undergraduate and medical school years, the purpose of the new program would be to encourage students to individualize their educational plans which would reflect their strengths and enhance their personal and career goals.

In the fall of 1985, the first class of PLME students matriculated at Brown Univeristy. The PLME, designed for students who are exceptionally well qualified, who are motivated, and independent learners, focuses on competencies not "requirements". Since our students are already part of the School of Medicine, we do not need qualifying pre-medical courses. We ask that the student be prepared, or competent, to proceed to the next level of training. If they have an excellent background in physics for example as demonstrated by earlier coursework or standardized tests, they need not repeat introductory physics here at Brown. Instead, they take responsibility for their competence in physics and use that as a foundation for physiology. They do not have a requirement for a specific course, just the knowledge. Students may also gain competence from courses taken at other universities or through work completed outside of courses. Similarly, the program does not require MCATs. Instead, reviews of academic performance are conducted each semester. This allows us to encourage students, such as those noted, to pursue advanced research in their field of interest,

ABBREVIATIONS USED:
MCAT: Medical College Admissions Test
PLME: Program in Liberal Medical Education

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study abroad, and to delve into volunteer projects that might not be possible otherwise. We provide them with support and guidance, then enjoy the process of their growth and maturation. We look forward to welcoming them as colleagues, the leaders of the new generation of physicians.

So, who are our students? Here are some demographics gathered since the "first class" matriculated in 1985. (note: Brown University School of Medicine had in place a seven year medical program, the Medical Education Program prior to the inception of the PLME. The statistics that follow are only for those students who were formally part of the PLME.)

Applications: The PLME applicant pool has gone from 1612 applicants in 1985 to 2206 applicants in 1995. There has been a steady increase in applicants since 1988. The number of admission offers ranged from a low of 102 in 1985 to a high of 160 in 1991. Matriculants have ranged from a small class in 1986 of 55 students to a large class of 83 in 1992. Thus far, there have been 658 matriculants.

Geography: Our accepted students have hailed from nearly all states and Puerto Rico, with the exceptions of Alaska, Arkansas, Mississippi, Oklahoma, South Dakota, and Utah. There have been no applicants from South Dakota or Arkansas. The top three states represented in the PLME are New York 25% (163/658), New Jersey 11% (72/658) and California 11% (71/658).We have had 28 international students over a ten year period.

Gender: Over the past decade the gender ratio of students who have matriculated in the PLME has averaged 52% (345/658) males and 48% (315/658) females. Men have comprised 62% and women 38% of first year matriculants of U.S. medical schools overall during the same 10-year period.

Race and Ethnicity: In looking at the race and ethnicity of the PLME over the past 10 years, we have a large representation of Asian Americans at 43% (280/658). We also have 13% African Americans (82/658), 2% Mexican American, and 0.2% Native Americans. Non-minorities comprise 37% (241/658) of our students.

Interestingly, 33% (219/658) of our students are from families where one parent is a physician. Of these students, 22% (49/219) are from families where both parents are physicians.

Finally, our students have the following average SAT scores: Verbal 654 and Math 717. Many high schools no longer rank their students, so it is not possible to report this information. However, we do note that 66% (430/658) of our students graduated from public high schools, 30% (195/658) from private high schools and 5% (31/658) from parochial high schools.

Table 1.—Undergraduate Concentrations Filed by Students in the Brown University Program in Liberal Medical Education (n=477)

Sciences:	
Applied Math-Biology	5
Applied Math-Econ	1
Aquatic Biology	1
Biology	117
Biochemistry	37
Biophysics	4
Bioengineering	4
Chemistry	1
Cognitive Science	2
Computer Science	9
Engineering	6
Geology-Biology	1
Human Biology	37
Mathematics	3
Neural Science	46
Physics	1
Psychology	20
Social Sciences	
Afro-American Studies	2
American Civilization	2
Anthropology	3
Developmental Studies	2
Economics	12
Environmental Studies	2
Health and Society	26
History	23
International Relations	4
Independent Conc	2
Political Science	12
Public Policy	8
Sociology	2
Urban Studies	2
Women's Studies	2
Humanities	
Art History	3
BioEthics	14
Classics	6
Chinese Studies	1
Comparative Literature	4
East Asian Studies	3
Education	1
English/American Lit	13
French Studies	2
German Studies	2
Hispanic Lit/Cult	2
Independent Conc	4
Judaic Studies	1
Music	3
Philosophy	7
Portuguese/Brazilian St	1
Religious Studies	3
Russian Studies	1
South Asian Studies	1
Visual Arts	4

What do PLME students do with their undergraduate education given the opportunity to devise and develop individual educational plans?

Concentrations: We have on file 477 declared concentrations. Of these, 431 are primary concentrations, 45 are second concentrations and 1 was a third concentration. (For statistical purposes the third concentration was averaged in with the second concentrations.) Using Brown's definitions of concentrations, we record that 64% (276/431) of our students receive a baccalaureate degree in the sciences and 36% (155/431) receive their baccalaureate in the social sciences and humanities. (see Table 1) However, one should also consider that 10% (46/431) of these students pursue a second concentration. Forty-six percent (21/46) of the second concentrations are in the sciences and 54% (25/46) in the social sciences or humanities which are further subdivided into the social sciences (30% ,14/46) or humanities (24%, 11/46).

Study Abroad: The PLME actively encourages our students to study abroad. Since they do not have to take MCATs during their junior year, 10% (68/658) have taken advantage of the opportunity to experience another culture. Most of these students have explored the health care delivery systems of these countries.

There are many questions asked about how many PLME students continue in the program after the first four years. In reviewing the past 7 years of the program, we see that 85% (365/430) go on to matriculate into medicial school. We note also that 13% (56/430) leave Brown to attend medical school elsewhere. In counselling these students, the reasons most commonly cited for leaving Brown are financial (It costs less to attend medical school in a student's home state.) Next, students may leave to find a school which may more closely meet their educational goals, for example, a M.D./Ph.D program. Finally there are the personal reasons such as joining significant others, family obligations, or the need to change from Brown to another environment.

The PLME does separate students because of academic difficulty. This accounts for 5% (22/430) of matriculants over the past 7 years. This group of students is the hardest to report on. I know them very well, as the PLME works hard to guide, assist, and counsel our students. We are in the business of retaining, not separating our students. In this group, I often encounter students who are ambivalent about pursuing a medical career. They struggle to come to grips with their choice and their academic performance reflects their indecision.

Finally, 9% (38/430) of our students leave for "other reasons". It has been the philosophy of the PLME to encourage our students to develop their interests, question where they are going and particularly to be

sure that medicine is truly their career choice. We have a wide range of extracurricular enrichment activities available to our students as well as the entire College's network of advisors to ensure that each student makes an informed decision about a medical career. Therefore, it is considered a success when one of our students withdraws from the program to pursue another career. When available, we track the careers most often pursued as they continue their education. Two students each left to pursue biology teaching or research. Other pursuits included nutrition (1), midwifery (1), engineering (2), history (1), international relations (1), art (2), and music (1). There also wereo 4 students who left for law school and 2 who went to business school. Ten students went on to complete their baccalaureate degrees but did not indicate their career path. There also were 8 students who left for personal reasons such as transfer to another college, financial difficulty or for medical problems.

Since the PLME's inception, we have graduated two classes for a total of 63 PLME students. A third class completed the continuum in May 1995. During their medical school tenure, the PLMEs achieved the following categories for their dean's letter: 27 (43%) in the "outstanding" category, 32 (51%) were in the "excellent" category, 3 (5%) were in the "very good" category and 1 (2%) was in the "good" category. The average National Board of Medical Examiners (NBME) Part I scores was 516, (national average, 500). Their average United States Medical Licensing Examination (USMLE) Step I score was 203.4 (national average, 200). The average USMLE Step II score for PLMEs was reported at 207.6 with the national average of 200.

Table 2.—Residency Choices of PLME Graduates MD Classes 1992-1995

Residency	# of PLMEs
Internal Medicine	20
Pediatrics	9
Obstetrics/Gynecology	5
Family Practice	4
Neurology	3
Ophthalmology	3
Diagnostic Radiology	3
Surgery	3
Urology	3
Anesthesiology	2
Orthopedics	2
Psychiatry	2
Emergency Medicine	1
Ear, Nose, Throat (ENT)	1
Plastic Surgery	1
Physical Medicine/ Rehabilitation	1

For residencies, the Brown MD classes of 1992-1995 have chosen widely from the various specialties (Table 2). Interestingly, 60.3% of the PLMEs initially entered the primary care specialties.

What is the most impressive and interesting to me as a practicing physician is the evaluation of the residency directors on Brown Medical School graduates. For the 24 responses on PLME students after their first year of residency on a scale of 1-5 (5 being superior) the average was 4.2. In my opinion, this indicates that the residency directors think that the PLME prepares our graduates well for their chosen careers.

My thanks to Dean Stephen Smith, M.D., Debra Abeshaus, Joan Fullerton and my husband, Larry Shaw, for their support and assistance in writing this article.

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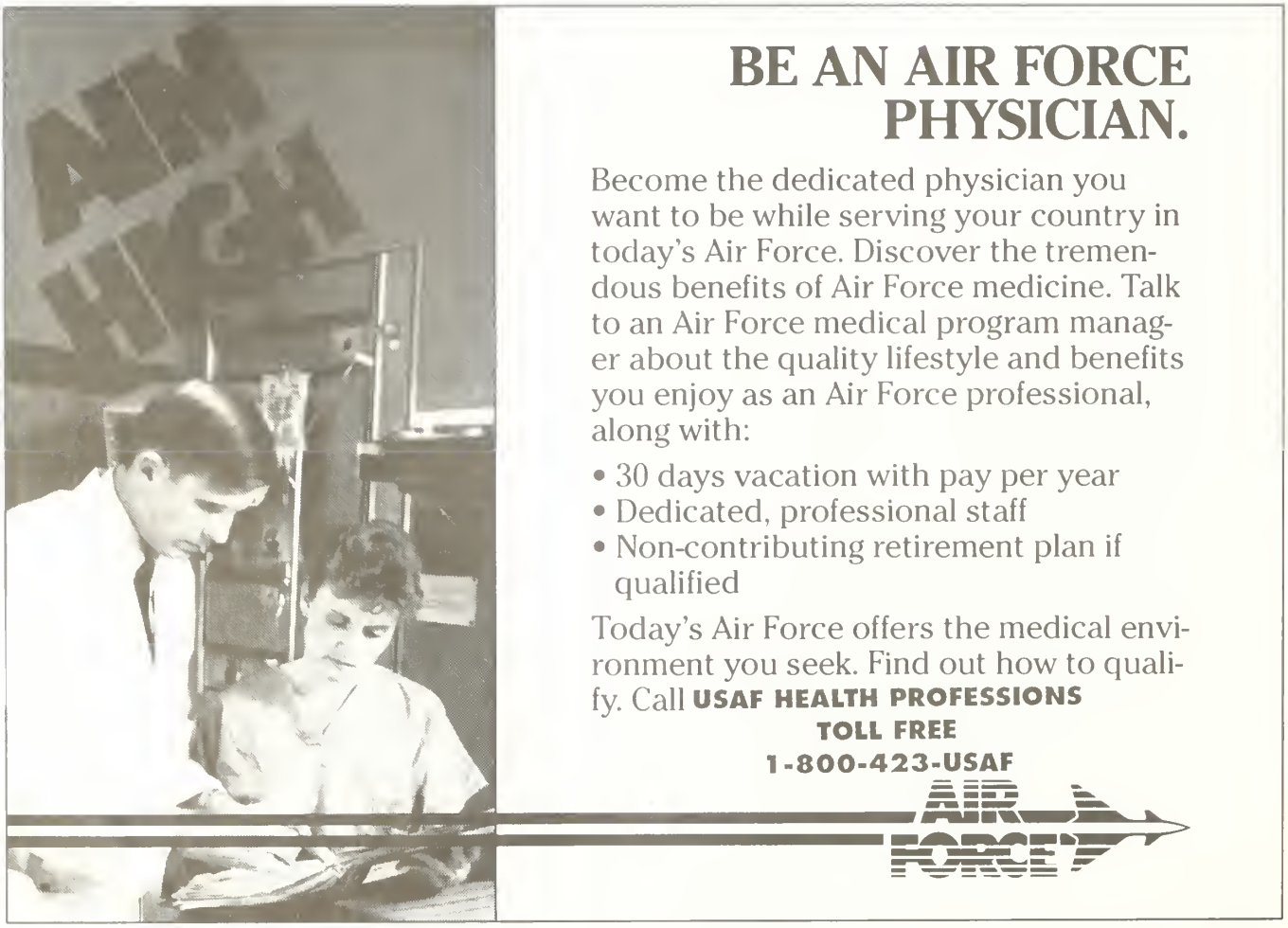
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Continuing Medical Education: A Lifelong Commitment

Patrick J. Sweeney, MD, PhD

Tomorrow's physicians will have to be educated CME consumers—ie, they will need to establish for themselves a program of continuing medical education that is reasonable yet comprehensive.

The final phase of a physician's education—and by far the longest—is his/her lifelong commitment to maintaining competence in the field. Medical schools provide didactic classroom instruction and supervised clinical experiences. Residencies and fellowships, with graduated responsibilities, form a logical transition from medical school to one's practice setting. Yet, throughout medical school and postgraduate residency education, students and residents are guided by some form of structured curricula, with time frames for completion, criteria for performance, and recognition for achievement—ie, graduation, board certification, etc.

One of Brown University School of Medicine's nine basic abilities is "Lifelong Learning." Nothing exemplifies the lifelong learning process more clearly than continuing medical education. Perhaps the key word is the "C" word—Continuing. The need for CME should be fairly obvious. For decades medical knowledge has been increasing exponentially; there is every reason to believe it will continue to do so. The National Library of Medicine indexes between 4,000 and 5,000 biomedical journals, comprising approximately one quarter of a million articles each year.[1] Yet despite this continually expanding knowledge base, the number of years dedicated to medical school and residency education has remained relatively constant. According to Dr. M. Roy Schwarz, Senior Vice President, Medical Education Science and Technology, American Medical Association, "If behavioral change is the goal of education, then the time available for such change is much greater in the CME sector of medical education than in the formal training sector." [2] Although CME is a professional necessity and comes naturally to many physicians, medical educators should assist students and young physicians in learning how to maximize their time. Indeed, the standards for accreditation of the Liaison Committee on Medical Education (LCME) state that "the faculty should foster in students the ability to learn through self-directed, independent study throughout their professional lives." [3] CME has to be a mindset, an integral part of one's routine. Otherwise the pressures and demands of a busy practice can easily displace one's CME activities.

Physicians, as a group, are highly self-motivated learners. Medicine, as a science, is an ever-changing, ever-expanding field of knowledge. One might even suggest that it is precisely this constant intellectual challenge that attracts students to the profession. Until recently it was assumed that physicians were sufficiently motivated by their personal desires and needs for self improvement to remain current in their fields by reading journals, attending hospital-based conferences like Grand Rounds, and consulting with colleagues. For better or for worse—and there are valid arguments supporting either opinion—the current field of continuing medical education bears little resemblance to the simplicity and efficiency of the "good old days." The following excerpts from a poem, "A CME Soliloquy," satirize the concept of traditional CME:

I'll describe a scene to thee
Which is known as CME:
Tuesday lunchtime every week
Thirty doctors bored and meek
To the lecture room repair,
Sign a list and take a chair...
Rises then the mighty Chief
And with introduction brief
Brings the speaker from the floor:
Dr. Jurgen Fritz von Bore...
Slides of graphs and dots and numbers
Cascade on the crowd that slumbers.
Sonorously some are snoring —
No one hears von Bore, who's boring.

—Jack Wainschel, MD, Arcadia, Calif.

Factors Influencing CME

Several factors are responsible for changes in the profession of CME. First, CME has become increasingly more regulated, directly or indirectly, by accrediting organizations, the American Medical Association, and governmental agencies. In 1981, the Accreditation Council for Continuing Medical Education (ACCME) was established to set standards and oversee the process of accreditation for sponsors of CME for physicians. The ACCME is composed of representatives from seven member organizations, plus one federal and one public representative. The y include:

1. American Board of Medical Specialties
2. American Hospital Association
3. American Medical Association
4. Association of American Medical Colleges
5. Association for Hospital Medical Education
6. Council of Medical Specialty Societies
7. Federation of State Medical Boards

The ACCME directly *accredits* some organizations—eg, medical schools, large hospitals, and specialty organizations—to sponsor activities for regional and national audiences. In addition, the ACCME *recognizes* state medical societies, which in turn accredit hospitals and health care agencies in their states to sponsor activities for physicians within their and nearby states.

Second, many hospitals and state licensing boards require evidence of one's attendance at formal continuing medical education activities for reappointment or relicensure. Recently several states have gone a step further. In addition to requiring a minimum number of hours of formal CME, many states now require a certain number of these required hours to be in *specified* areas—eg, risk management and bloodborne pathogen control. Interestingly, only 17% of physicians surveyed in a 1990 poll indicated that their reason for participating in formal CME activities was to fulfill requirements for licensure or board certification. [4] Documentation of attendance is a dual responsibility; it is the responsibility of the CME sponsor to provide each participant with proof of attendance, and it is the responsibility of physicians to maintain these documents in the event they are required to validate their CME activities.

ABBREVIATIONS USED
ACCME: Accreditation Couoncil for Continuing Medical Education
ACME: Alliance for Continuing Medical Education
CD-ROM: Compact disc, read only memory
CME: Continuing Medical Education
PCP: Primary care providers

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Table 1.—Telemedicine Publications

Telemedicine Journal, edited by Mark A. Goldberg, MD, $97 a year for individuals, $167 for institutions; (800) 654-3237. The international quarterly, peer-reviewed journal covers subjects relating to combining medicine and telecommunications for high-quality, cost-effective health care.

The Journal of Telemedicine and Telecare, $128 a year; Public Subscription Dept, Royal Society of Medicine Press, P.O. Box 9002, London W1A OZA, United Kingdom. Academic quarterly, peer-reviewed journal.

Telemedicine Today, edited by Ace Allen, MD, $75 a year; (800) 386-8632. Quarterly news magazine aimed at telemedicine specialists and practitioners. Stresses clinical issues and includes surveys and evaluations of telemedicine programs plus technology news and how-to articles.

Healthcare Telecom Report, $447 a year; (301) 540-3665. Twice-monthly newsletter about clinical and administrative applications of communication systems.

Global Telemedicine Report, $295 a year; (301) 540-3665. Monthly international newsletter on telemedicine markets and business opportunities.

Telemedicine, $397 a year; (415) 905-2371. Monthly newsletter on the use of telecommunications in health care.

Telemedicine Buyers' Guide, $9.95; (415) 905-2655. Industry overview. Names, contacts, and descriptions of vendors and consultants.

Telemedicine, Office of Local and Rural Health Systems, Kansas Dept. of Health and Environment, $10; (913) 296-1200. The four-volume report covers sources, vendors, policy issues, and community planning.

The Telemedicine Handbook: Improving Healthcare with Interactive Video, by Jane Preston, MD, Telemedical Interactive Consultative Services Inc., $95 plus shipping and handling; (512) 480-2247. The handbook discusses the technology as well as economics, management, and ethical and legal issues.

Rural Telehealth, Telemedicine, Distance Education and Informatics for Rural Health Care, HHS Office of Rural Health Policy, free; (301) 656-3100. Describes technology, applications, existing projects. Includes contact and reference list.

—Source, *American Medical News*, May 1, 1995

Third, CME has become a business—a big business! In 1975, the Alliance for Continuing Medical Education (ACME) was established as an organization for CME professionals to share their knowledge. Membership in the organization has grown to over 1600 CME professionals, and attendance at the ACME Annual Meeting has increased from 103 in 1976 to 1,020 at the 20th Annual Meeting in January of 1995. In addition to CME offices traditionally housed within medical schools, hospitals, and specialty societies, the profession has witnessed a marked increase in the formation of communications companies and other for-profit agencies designed to assist with medical meeting management. Multi-day conferences involve making arrangements for travel, lodging, food, and audio-visuals. Brochures have to be printed, mailing lists purchased, and deadlines met. Many CME professionals and small organizations lack the expertise or the time to effectively perform these conference planning skills. It is not unusual for a CME office to concentrate on the academic integrity of a conference and contract with a meeting planner to perform some of the management services listed above.

A fourth factor responsible for change is technology. Not too long ago physicians in rural communities were more than geographically isolated—they were also *academically* isolated from their peers at the tertiary level hospitals. The demands of their busy practices, in combination with long travel times, often made it impractical, if not impossible, to avail themselves of the Grand Rounds, Tumor Boards, and other weekly educational sessions offered at the large metropolitan medical centers. At the same time, it was economically prohibitive for the small community hospital to bring visiting lecturers to its medical staff. Satellites, fiber optics, and computers now offer these physicians the opportunity to actively participate in these conferences without leaving their communities. They can "attend" these lectures, and be able to interact with the speaker, via live teleconferencing. Variations of this technology, known as telemedicine, permit physicians to transmit X-rays, electrocardiograms, and other diagnostic tests to specialist consultants hundreds of miles away, saving valuable time and often saving their patients the inconvenience and expense of a trip to the medical center. Although some early attempts at telemedicine were disappointing, constantly improving technology has improved both visual and auditory transmission. Many concerns need to be addressed—eg, cost effectiveness, regulations, standards, variations in telecommunications infrastructure, malpractice, multi-state licensing of physicians, and payment for telemedical services. Some of these issues, however, are concerned primarily with teleconsulting—individual patient consultations—and are not applicable to teleconferencing. For those interested in further information on telemedicine and its applications, a list of publications on the topic is provided in Table 1.

Medical teleconferencing is not new. Several previous attempts at targeting large network audiences met with varied success. Lifetime Medical Television network ceased operation in August, 1993, and 1 year later, Christopher Whittle's interactive Medical News Network was canceled. In December, 1994, American Medical Television ceased telecasting after 6 years.[5] It would appear that successful medical teleconferencing must be fully interactive, targeted to specific physicians, and available on demand, when and where it's wanted. Fiberoptic technology addresses these needs by merging the the capabilities of television, computer, telephone, and CD-ROM.

Changing Content

The ACCME has seven "essentials" with which an organization must comply in order to be an accredited sponsor of CME. The second of these essentials is "needs assessment." Simply stated, a CME activity should address a need identified by the physicians for whom the activity is targeted. The days when a pharmaceutical representative would walk into a medical staff office and pay to have an expert flown in from across the country are gone! The need for an educational intervention must be identified and documented. Typical sources of needs assessment include staff surveys, quality assurance audits, infectious disease reports, medical record reviews, evaluations of previous CME activities, and minutes from various hospital committee meetings.

In response to the changing needs of physicians, the definition of CME and content of CME programs have changed. For many years CME concentrated on clinical topics—ie, how to diagnose and treat a variety of diseases and conditions. Over the past decade programs have increasingly included sessions on risk management, medical-legal issues, ethical dilemmas, and doctor-patient communication skills. Most recently, despite the administration's failure to enact comprehensive health care reform, physicians have recognized the need to know how to deal with changes in the health care delivery system. Consequently two of the hottest tickets in CME at the

present time are managed care and primary care. Physicians who have not been practicing in a managed care environment need to know the implications of managed care for their patients and their practices. The shortage of primary care providers (PCPs) necessary to meet the demands of managed health care demonstrates how CME can be responsive to changing needs. The recent recognition of the need for physicians to improve their primary care skills has generated thousands of lectures and conferences on the topic. Simply designating physicians as "primary care providers" does not magically endow them with the knowledge and skills needed to function as PCPs. Many primary care physicians—including general internists, family practitioners, pediatricians, and obstetrician-gynecologists—were educated in a system that encouraged referrals, even for procedures they could have performed themselves. These referrals were made, not to generate additional income, but to offer their patients the best care available from physicians who had devoted many additional years developing expertise in their special fields. With the advent of managed care and capitated care, these PCPs are now being called upon to limit specialist referrals. Consequently there is a great demand for primary and preventive care "refresher" courses designed to re-educate physicians philosophically as well as clinically.

Another way of addressing specific needs is personalized CME. Originally designed to respond to the needs of physicians identified as requiring focused or remedial education by a state licensing board, a hospital medical staff, or other authoritative body, personalized CME programs have the potential to re-train physicians or to teach new surgical skills. Sometimes called "mini residencies," these programs allow physicians the opportunity to spend 1 to 2 weeks in a medical center or working side-by-side with a preceptor to develop specific proficiencies. While the number of physicians who have participated in such activities is small, the potential for targeted, individualized education is great.

The Future of CME

Future directions in the field of continuing medical education will be linked to changes in graduate and postgraduate medical education, further research into the principles of adult learning, and advances in technology. Medical schools, which have traditionally relied upon tests of one's knowledge base, are focusing now on problem-based learning, performance-based assessment, and competency-based education. Residency programs and hospital medical staff offices are concerned about certification and credentialling. Physicians are trying to provide quality care for their patients while simultaneously maintaining competency with ever-changing diagnostic and therapeutic interventions. Mandatory recertification has removed the voluntary component of CME for many specialists.

For the immediate future, the cornerstone of continuing medical education will likely remain the hospital-based, weekly clinical conferences. However, as ambulatory services replace in-patient care, hospital-based programs will increasingly concentrate on patients requiring more intensive care. Sophisticated equipment and high-tech procedures will require "hands-on" workshops or preceptorships instead of lectures—designed to teach competency, not just knowledge. Computer technology will offer increased opportunities for telemedicine and various self-directed learning programs. Demand for the latter will undoubtedly increase coincident with the increasing computer literacy of students graduating from our nation's medical schools.

The US health care delivery system is undergoing changes that are shaking its foundations. Some changes are good; some are not. Some will survive, others will not. Whatever the final "product," it is safe to assume that the system we have known for decades is gone. While many health care providers will grieve its loss, most will adjust and continue to provide a level of care that is envied throughout the world.

Scientific knowledge and its clinical applications are expanding exponentially. Tomorrow's physicians will have to be educated CME consumers—ie, they will need to establish for themselves a program of continuing medical education that is reasonable yet comprehensive. Individual learning styles differ. Some physicians prefer multi-day conferences in resort locations; they not only enjoy the time away from the office, but benefit from the opportunity to interact with colleagues and experts in their fields. Others set aside time to read journals. Most physicians have a varied CME program, combining journal reading with Grand Rounds and multi-day conferences. Regardless of one's preference, the importance of CME cannot be overemphasized. Former Surgeon General C. Everett Koop, addressing the 3rd International Conference on Continuing Medical Education, said, "CME should be an inherent part of our belief system as physicians . . . continuing medical education is not a luxury, it is a necessity in dealing with contemporary health problems . . . it is our duty . . . it should also be our desire, our privilege, and our ultimate fulfillment."[6]

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Resident Physician Abstracts: Annual Scientific Meeting Of the RI Chapter, American College of Physicians, 1995

Fred J. Schiffman, MD, FACP

The Ninth Annual Joint Meeting of the RI Chapter of the American College of Physicians (ACP) and the Department of Medicine at Brown University was held at The Radisson Hotel on Tuesday and Wednesday, April 25 and 26, 1995. Participation by Brown University medical residents was remarkable once again because of quantity and quality of their submissions. In total 12 abstracts were accepted for oral presentation and 80 for poster presentation.

Posters were displayed during the Tuesday evening session in the Plantations Ballroom. John Noble, MD, FACP, director for primary care, Boston University School of Medicine; project director, Robert Wood Johnson Foundation Generalist Physician Initiative of the Boston University School of Medicine, was the American College of Physicians' representative. His lecture topic was "Community-Based Teaching."

This year, as in previous years, the posters represented the work of resident physicians and faculty from each of the Brown-affiliated hospitals. The following day in the Plantations Ballroom, oral presentations were given. Poster presentations from the previous evening remained standing so that participants in the Annual Scientific Meeting could view the posters and continue to interact with authors.

On Wednesday, April 26th, following a continental breakfast and a welcome by Michele G. Cyr, MD, FACP, governor of the Rhode Island Chapter, six oral presentations were made. From 3:00-4:15 pm, six more were presented. The presenters discussed work they had done, which represented either basic or clinical studies. They are included at the end of this article. The 80 poster presentations represented clinical vignettes which had interesting and instructive implications.

On April 26, a panel discussion was convened at 10:30am on "Hormone Replacement Therapy." It was moderated by Ann Moulton, MD, director, Division of General Internal Medicine Fellowship Program, Rhode Island Hospital and associate professor of medicine, Brown University School of Medicine. Panelists included Douglas Kiel, MD, MPH, FACP, associate director, Medicine Research, Hebrew Rehabilitation Center for Aged, Boston, MA, assistant professor of medicine, Harvard Medical School and co-director, Rhode Island Hospital Osteoporosis Research Center; Peter Herbert, MD, FACP, adjunct professor, Brown University, clinical professor of medicine, Yale University and chairman, Department of Medicine, Hospital of St. Raphael, New Haven, CT; Kathryn Ann Martin, MD, assistant in medicine, Massachusetts General Hospital and instructor in medicine, Harvard Medical School.

At noon, Dr Noble brought news from the college as the official American College of Physicians representative. There also was presentation of the Irving Beck Award this year to Richard K. Mead, MD. The award is given to an individual who has exemplified those qualities that distinguished Dr Beck's career, which was dedicated to the care of patients and to the pursuit of scholarship in internal medicine.

At 1:15 pm, as suggested by members of the ACP Governor's Council, a new format for continuing education was instituted. A series of "Meet the Professor" sessions was conducted by Angelina C.A. Carvalho, MD, chief of hematology, VA Medical Center and associate professor of medicine, Brown University School of Medicine; J. Donald Easton, MD, physician-in-chief, Department of Neurology, Rhode Island Hospital and professor and chairman, Department of Clinical Neurosciences, Brown University School of Medicine; Steven M. Opal, MD, staff physician and director of the Travel Clinic, Memorial Hospital of RI, associate professor of medicine and director, Infectious Disease Fellowship Program, Brown University School of Medicine; and Joseph R. Tucci, MD, FACP, director of endocrinology and metabolism, Roger Williams Medical Center and Associate Professor of Medicine, Brown University School. At these separate sessions, resident physicians and other ACP members including those who are hospital-based and office-based, participated in discussions that centered on cases prepared by medical chief residents and practicing physicians. It was felt that this was a great success and will probably be included in the program for years to come.

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Oral Presentations

1. Pleural Effusion Can Cause Diastolic Collapse in the Absence of Pericardial Effusion.
R.M. Anastacio, MD, A. Sadaniantz, MD

Diastolic chamber collapse is a sensitive indicator of cardiac tamponade. Two case reports in humans and one animal study described that diastolic chamber collapse can be induced with pleural effusion. The purpose of this study is to report the rate of diastolic chamber collapse in a clinical population of patients with pleural effusion.

We selected 39 consecutive patients with moderate or larger pleural effusions from the echocardiography database. Patients with small or greater pericardial effusion were excluded. The 2-D and M-mode echocardiograms were reviewed, and the presence of right and left atrial, right and left ventricular diastolic collapse was noted by consensus agreement.

Four patients were excluded because of significant pericardial effusion. Among the remaining 35 patients, 11(31%) had right atrial, 1(3%) right ventricular, 2(6%) left atrial and none had left ventricular diastolic collapse. The overall rate of diastolic chamber collapse in this cohort of patients with pleural effusion was 34%.

These results indicate that a significant number of patients with pleural effusion show evidence of diastolic chamber collapse in the absence of pericardial effusion. The mechanism, hemodynamic and clinical significance need to be further investigated.

2. A Cost-effective Modification of the Blood Culture Protocol at Roger Williams Medical Center.
Mark R. Bell, MD, Phillip O' Dowd, MD

A retrospective study of blood culture records cov-

ABBREVIATIONS USED

ACP: American College of Physicians
ADL: Activities of daily living
CHF: Congestive heart failure
CPR: Cardiopulmonary resuscitation
DVT: Deep venous thrombosis
FPH: Familial pulmonary hypertension
HER: Human Immunodeficiency Virus Epidemiologic Research Study
HIV: Human immunodeficiency virus
KS: Kaposi's sarcoma
MAI: Mycobacterium avium-intracellulare
MI: Myocardial infarction
MM: Multiple myeloma
MPS: Myeloproliferative syndrome
PCD: Plasma cell dyscrasia
PCP: Pneumocystis carinii pneumonia
PSC: Pluripotential stem cell
PPH Primary pulmonary hypertension
PTCA: Percutaneous transluminal coronary angioplasty
RB: Retinoblastoma
ReMI: Recurrent myocardial infarction
RCoF: Ristocetin CoFactor
SPH: Secondary pulmonary hypertension
TMP/SMX: Trimethoprim/sulfamethoxazole
TT: Thrombolytic therapy
vWF: von Willebrand's Factor

ering a 24-month period (Jan. 1, 1993-Dec. 31, 1994) was performed at Roger Williams Medical Center, a general medical hospital with a substantial oncology inpatient service. A total of 15,789 blood cultures were obtained for evaluation during the time period reviewed. Of this total, 36 cultures were positive for anaerobic bacteria. Thus, anaerobic bacteria were present in only 0.2% of all cultures obtained. Review of the clinical situations resulting in positive cultures revealed that in most instances a high degree of suspicion for anaerobic pathogens was present prior to the blood culture results being reported. The patient conditions associated with anaerobic bacteremia include: abdominal abscesses, gynecological infections, necrosis, gangrene, and pulmonary abscesses. Given the extremely low rate of positive cultures for anaerobic bacteria and the fact that clinical evidence suggested the possibility of anaerobic bacteria prior to obtaining a positive culture it has become hospital policy to forego routine anaerobic blood culture testing unless specifically requested on the blood culture order. The medical staff has been informed of the illnesses in which anaerobic infection is probable. By this policy Roger Williams Medical Center estimates a minumum direct cost savings of close to $30,000 per year. Our experience may motivate other institutions to review their blood culture protocols.

3. Primary and Familial Pulmonary Hypertension: Evidence for a Single Entity.
J. Jimenez Carcamo, MD, L. Reid, MD, A. Carvalho, MD.

The objective of this study was to assess the value of Factor VIII (FVIII) complex levels in differentiating primary pulmonary hypertension (PPH) from familial PH (FPH), secondary PH (SPH) & from their respective relatives. We measured FVIII:C by coagulant activity, von Willebrand's Factor (vWF) by both antigenic (vWF:Ag) and functional assays (Ristocetin Cotactor–RCoF) in 236 subjects (46 PPH; 45 PPH relatives; 9 FPH; 37 FPH relatives, 12 SPHcardiac; 8 SPH–thromboemb, TE; 14 SPH misc; 5 SPH relatives; and 60 normal subjects). We found the vWF:Ag levels to be significantly higher than normal in both PPH and FPH, $P<0.0001$, but not different between the two groups. The vWF:Ag levels were highest in SPH-cardiac and SPH misc, and differ significantly from PPH; FPH and normal ($P<0.0001$). The lowest levels of vWF:Ag were noted in SPH (TE). There was no significant difference in vWF:Ag between patient groups and their respective relatives. The RCoF levels were significantly higher in all patient groups than normal ($P<0.0001$), without differences between patient groups and their relatives. The highest FVIII:C levels were noted in SPH-cardiac & SPH–misc followed by FPH. FVIII:C levels were lowest in SPH (TE), and relatives of FPH. FPH patients differ significantly from their relatives in FVIII:C ($P<0.0001$). Previously, we reported a significant disproportion between high RCoF levels to low vWF:Ag2 and a unique vWF multimeric pattern in 6 PPH patients, that distinguish them from SPH. In this larger study only a subgroup of PPH and FPH showed such RCoF/vWF:Ag disproportion. This study also confirms marked FVIII complex alterations in all forms of PH. Levels of vWF:Ag can distinguish PPH and FPH from SPH but not PPH from FPH. FVIII complex levels in relatives of both PPH and FPH already differ significantly from normal. Detailed multimeric analysis of vWF and its mRNA expression could be helpful in understating the pathogenesis of PPH and FPH.

Adnan Naber, MD, poses before his poster presentation on "Stridnor in an Adults: Vocal Cord Dysfunction."

Curtis Donskey, MD, makes his oral presentation on physicians' knowledge of medical costs.

4. How Should Recurrent Infarction Following Thrombolytic Therapy Be Treated?
George R. McKendall, MD, Michael P. Carson, MD, Mary Jane McDonald, RN

The optimal management of recurrent infarction (ReMI) following thrombolytic therapy (IT) is uncertain. PTCA as a strategy for ReMI following TT may not influence outcome and has an increased mortality rate when unsuccessful. Repeat thrombolytic therapy (ReTT) for ReMI is largely unstudied but may be a suitable alternative to PTCA. To determine the optimal management of ReMI following TT, a retrospective review of 415 consecutive patients who received TT was undertaken.

Fifty acute MI patients developed ReMI after TT. Fifteen (30%) underwent emergent PTCA, 16 (32%) were treated with repeat TT alone (ReTT), and 19 (38%) had both. Of the 35 pts in the ReTT and both groups who had initial treatment of ReMI with TT, 24 (69%) had prompt symptom relief, 16 (46%) had ECG improvement, and 16 (46%) had both. All patients survived. Hospital events and outcome are shown.

	ReTT	PTCA	BOTH	P
Age (yrs)	55±9	54±13	58±8	.79
Hours to ReMI	39±55	10±31	33±52	.22
Recurrent ischemia (%)	38	27	21	.55
Subsequent PTCA or CABG (%)	50	7	11	.004
Bleeding complication (%)	0	7	6	.58
LV EF(%)	49±13	41±6	46±7	.15

Subsequent elective revascularization was higher in the ReTT group. Hospital events and discharge ejection fraction did not differ according to treatment of ReMI.

A strategy of ReTT as an initial treatment for ReMI is safe and effective. Emergent FICA can be reserved for failure of ReTT.

5. Physicians Lack Knowledge of Medical Costs
Curtis Donskey, MD, Wady Aude, MD, Howard Dubin, MD

Prior to starting a cost education program, physicians were surveyed to determine their knowledge of medical costs. Previous studies have demonstrated that physician's knowledge of medical cost is poor.

A questionnaire containing 41 items including room rates, medications, and selected diagnostic tests was distributed at three Brown University affiliated teaching hospitals. Three groups were surveyed: 1. Physicians (124), 2. Nurses (32), 3. Non-medically trained people (38). Estimates within +/- 25% of the true costs were considered "good." Each group's knowledge was compared. Subgroup analysis was done to determine if physicians knowledge was improved with additional years of training or practice.

Physicians' ability to supply a "good" estimate of medical costs was uniformly poor. Estimates were least accurate for expensive tests and medications. Physicians were not more accurate in estimating coats than either nurses or non-medically trained people (see table). There is no apparent increase in physician's knowledge with additional years of training or practice.

	Percentage of responses failing within +/- 25% of true cost				
%	Room Rate	Labs	Radiology Tests	Special	Meds
MDs	47	18	22	17	19
Nurses	52	19	27	20	18
Others	43	15	23	17	15

Physicians lack knowledge of the costs of the tests and medications they order. Contrary to our expectation, knowledge did not improve with additional years of training or practice. Physicians must improve their knowledge of medical costs if they wish to provide cost-effective care for patients, and if they are to play a role in the ongoing debate over health care reform. A follow-up study to determine the effectiveness of a cost education program in one of the three teaching hospitals is in progress.

6. HIV Related Pericardial Effusion.
Jeanne Oliva, MD, Michael Stein, MD

Prior to the emergence of HIV, the most common

causes of pericardial effusion were malignancy, idiopathic or viral pericarditis, uremia, and myocardial infarction. Documented etiologies of HIV-related pericardial disease include Kaposi's sarcoma as well as several infectious causes, most commonly MAI and TB. However, pericardial fluid analysis is often not diagnostic. This series was done to assess the clinical presentation and etiologies of HIV associated pericardial effusion at RIH.

Since 1978 there were 11 patients with HIV associated pericardial effusion admitted to RIH as determined by ICD-9 diagnoses. Of the 11, 10 were men, and 8 had a documented CD4 count less than 100. Admitting diagnoses included fever, pleural effusion, pericardial effusion, dyspnea, anasarca, DVT, hepatic microabscesses and septic arthritis.

The presenting symptoms and echocardiographic findings are shown below, in comparison to a similar series of 14 patients. In the RIH group the initial indications for echo included cardiomegaly on chest x-ray (4), pericardial rub (3), elevated pulsus paradoxus (1), CHF (1), and to rule out valvular vegetations (2).

	RIH	Chest (1992)
Symptoms (%)		
chest pain	18	29
cough	36	36
dyspnea	36	79
level	45	57
no cardiopulm. sx	27	7
Effusion size (%)		
small	18	71
moderate	36	21
large	45	7
# diagnostic taps/# taps	2/6	1/2
#deaths in hospital	4	4

Based on indication for echo, 27% of effusions at RIH were unsuspected. The two diagnoses made were bacterial pericarditis (mod.), and lymphoproliferative disease (eg, KS vs lymphoma). Of the four patients who expired, only one had a large effusion, and the fluid analysis was not diagnostic. The clinical presentation of pericardial effusion in HIV disease is broad. Despite many known etiologies, a large percentage have no documented cause.

7. Age and the "Short Code."
Peg Miller, MD, Terri Fried, MD, Mike Stein MD, Tom Wachtel, MD, Robert Woolard, MD

Age has been associated with unsuccessful cardiopulmonary resuscitation (CPR). But the relationship between age and duration of CPR ("code") has not been studied. To address this question, we reviewed charts of all patients who underwent CPR in a large urban teaching hospital in 1993. We recorded CPR duration, initial and subsequent EKG rhythms, demographics, functional status, and comorbidities.

Of 122 CPR episodes, 35 (29%) were successful and 87 (71%) unsuccessful. Among the nonsurvivors, age>75 was significantly associated with receiving fewer minutes of resuscitation, and three elderly patients received no attempt at resuscitation despite the absence of any advance directives in the medical record. The survivors received a median of 15 minutes of resuscitation compared to a median of 24 minutes in the nonsurvivors, and one-quarter of the nonsurvivors received 15 minutes or less; therefore, we defined a "short code" as lasting 15 minutes or less. In bivariate analysis, age>75 was significantly associated with receiving a short code (OR 3.42, 95% CI 1.30, 9.04). Number of rhythm changes during the code was also associated with receiving a short code but initial presenting rhythm, ADL status, Charlson comorbidity score, presence of malignancy, and presence of chronic renal failure were not. In a logistic regression model including age and number of rhythms during the code, age>75 remained independently associated with receiving a short code (OR 3.26, 95% CI 1.12, 9.48).

We conclude that elderly patients are more likely to receive shorter attempts at CPR. While it is not known if longer attempts would affect survival, these findings may represent a bias against elderly patients in the minds of the physicians performing CPR.

8. A Comparison of Asthma Management in the Elderly Among Internists, Pulmonologists, and Allergists.
A. Parikh, MD, C.B. Sherman, MD, J.C. Celedon, MD, S.S. Braman, MD, D.G. Kern, MD

To determine current practice in treating asthma in the elderly, a questionnaire was distributed to 78 internists (IM), 16 pulmonologists (P) and 7 allergists (A) in RI. Three case studies were used to illustrate mild, moderate and severe asthma. For each case, physicians were asked to select initial treatment, as well as additional therapy when the patient failed to respond to initial treatment. Few IM but most P and A had read the National Asthma Education Program's guidelines for asthma management (IM: 42.1% vs P: 68.8% vs A: 100%, P=0.003). For mild asthma, all three groups thought that best initial treatment consisted of inhaled beta agonists PRN (IM: 73.3% vs P: 68.8% vs A: 71.4%, P=0.92); for non-responders, most IM and P but far fewer A chose inhaled steroids Q8 hours (IM: 60.0% vs P: 56.3% vs A: 14.3%, P=0.07). For moderate disease, a majority of each group chose inhaled steroids Q6 hours as initial therapy (IM: 68.0% vs P: 75.0% vs A: 42.9%, P=0.32); for non-responders, most P and A but far fewer IM chose a short course of oral steroids (IM: 38.7% vs P: 62.5% vs A: 57.1%, P=0.15). Finally, for the initial therapy of severe disease, the predominant choice for IM and A but not P was inhaled beta agonists Q6 hours plus inhaled steroids Q6 hours plus a short course of oral steroids (IM: 44.0% vs P: 31.3% vs A: 42.9%, P=0.99); for non-responders, physicians generally chose a short course of oral steroids but there was less concordance of opinion (IM: 30.7% vs P: 50.0% vs A: 14.3%, P=0.23). These results suggest that in the elderly, as asthma severity increases, the choice of therapy becomes increasingly discordant both within and between specialties.

9. Tolerance of Pneumocystis Prophylaxis in HIV Infected Women.
Mark D. Vannorsdall, MD, J.W. Goodman, H. Kwakwa, T.P. Flanigan, J.D. Rich

Pneumocystis cariniis the most common life threatening opportunistic infection in HIV-infected patients and it is the only one for which highly efficacious long term prophylaxis now exists. Trimethoprim/sulfamethoxazole (TMP/SMX), the most effective PCP prophylaxing agent, is reported to have treatment limiting toxicities in up to 50% of HIV positive men. No studies to date have evaluated the tolerance of PCP prophylaxis in women, the fastest growing segment of the AIDS population in the US. This study is the first to evaluate the tolerance of TMP/SMX as well as Dapsone and aerosolized Pentamidine (AP) exclusively in women. METHODS: A retrospective chart review of women with CD-4 counts less than 300 followed at the Miriam Immunology center from 1990 to 1994.

	TMP/SMX	Dapsone	AP
Took at some time:	60	54	20
# stopped/adverse reaction:	8	3	1
% stopped/adverse reaction:	13	6	5
Cause of discontinuation:	rash, GI upset	rash	wheeze

Most women who took either TMP/SMX, Dapsone or AP for PCP prophylaxis tolerated it well. However, 13%, 6% and 5% in each respective group developed adverse reactions requiring discontinuation. These case control results suggest the HIV-infected women may tolerate TMP/SMX better than HIV-infected men.

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These and other reported differences in the clinical manifestations of AIDS in women and men highlight the need for prospective trials in HIV infected women, such as the ongoing HER Study. Given the low cost, proven efficacy and added partial protection against toxoplasmosis, TMP/SMX remains the first line PCP prophylaxis for HIV-infected women. With aggressive TMP/SMX treatment including desensitization or re-challenge in patients developing adverse reactions, the vast majority of HIV infected women may be effectively prophylaxed against PCP.

10. Short Course Oral Dexamethasone for Thrombocytopenia in AIDS.
Bharat Ramratnam, MD, Michael Newstein, MD, PhD, Timothy P. Flanigan, MD

Thrombocytopenia occurs in 30%-60% of HIV infected persons. Many treatments have been attempted, including long-term corticosteroids. zidovudine, intravenous IgG, and splenectomy with variable response rates. Recently, the efficacy of pulse, high-dose dexamethasone therapy was demonstrated in 10 patients with non-HIV associated idiopathic thrombocytopenic purpura. No studies, to our knowledge, exist on the use of this therapy in the setting of HIV infection. We report two patients with HIV-related thrombocytopenia whose platelet counts increased after a short course of oral dexamethasone (10 mg po qid x 4 days). Both patients were HIV+ injection drug users (CD4 count <10/mm^3) who had been thrombocytopenic for >6 months. The thrombocytopenia was refractory to zidovudine and both patients became symptomatic with epistaxis and melena. Both patients had an initial response to one course of oral dexamethasone. Platelet counts remained elevated in patient 1 but started decreasing after 4 weeks in patient 2. Neither patient reported any adverse effects. Short course. high-dose oral dexamethasone may be an attractive therapeutic alternative to long-term corticosteroid treatment in HIV associated thrombocytopenia.

11. Machine Induced Misadministration of an Oral Hypoglycemic Agent.
S.C. Schlozman, MD, R.E. dela Rosa, MD, B.C. DeMoranville MD, J.V. Hennessey MD, FACP

Case 1: A 74-year-old white male with Parkinson's Disease was found unresponsive with a blood glucose of 27 mg/dl. He recovered consciousness immediately after resuscitation with D50. His medications included Ditropan® for urinary incontinence, but a thorough study of his prescribed medications did not elucidate the etiology of his hypoglycemia. Three days after the initial episode, he was again found unconscious. Serum glucose obtained 10 minutes after D50 infusion showed a blood glucose level of 39mg/dl, with elevated C-peptide and insulin levels. A complete investigation of his medications revealed that the packages labeled Ditropan® contained Micronase® tablets. The pharmacy was notified, and the patient received the prescribed Ditropan® with subsequent stabilization of his serum glucose levels.

Case 2: A 76-year-old white male with end stage lung cancer and depression who was also taldng Ditropan® was noted to have asymptomatic fasting blood glucose levels between 60 and 70mg/dl, after previous measurements had been consistently between 110 and 140mg/dl. Because these episodes occurred at the same time as case 1, examination of the patient's medications revealed that his Ditropan® packages also contained Micronase® tablets. After this was corrected, the patient's serum glucose levels returned to their baseline.

Medications are by far the most common cause of hypoglycemia. Although there have been reports of "soundalike" medication errors, such as Dymelor for Diamox, the cases described above appear to be due to the similar appearance of Ditropan® and Micronase® tablets and subsequent incorrect sorting by the pharmacy packaging machine. As these cases demonstrate, a thorough investigation of the prescribed medications may elucidate a new mechanism for disease in otherwise unexplained episodes of hypoglycemia.

12. Molecular Misery Loves Company.
Lidia Vesely, MD, N. Freeman, MD

The rare occurrence of a myeloproliferative syndrome (MPS) and a plasma cell dyscrasia (PCD) in the same individual is not inconceivable when one considers the possibility of a molecular event occurring at the pluripotential stem cell (PSC) level. We describe a patient in whom each of these uncommon diseases is documented. A 69-year-old male presented in 1990 with an isolated thrombocytosis of 650,000/ul. Secondary causes for thrombocytosis were ruled out; platelet aggregation with epinephrine was impaired, confirming a diagnosis of essential thrombocytosis. With hydrea the platelets decreased to normal. In 1994, a diagnosis of multiple myeloma (MM) was made based on an increase IgGk of 8gm/dl, a marrow with 87% plasma cells, and bone films with an abnormal right femur. The hydrea was discontinued and the patient started melphalan and prednisone. The concurrence of the two aforementioned entities might be considered unfortunate; the literature describes only scattered cases. We propose, after reviewing the results from molecular analyses, that there may be a link between the two. There is evidence that MM is a disease that involves early stem cells and becomes manifest at the level of the mature B cell; MM may result from several acquired genetic alterations, coupled with contributions from other cells influencing B cell maturation. Ras oncogene mutations are frequent in MM and may occur in the MPS; aberrations in the p58 gene has been detected in human myelomas (20%) and in the MPS; RB abnormalities, which can affect IL-6, a myeloma growth stimulant, has been observed in both disorders. Although specific chromosomal anomalies have not been well established in MM, multiple aberances have been decribed in the MPS, and a deletion of 7 has been reported in both. The current data support the possibility that a genetic defect, starting at the level of the PSC may result in more than one hemtologic disorder involving distinct cell lines.

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Physicians Newly Licensed in RI During 1994

Nikki Deary, Milton W. Hamolsky, MD, and Stanley M. Aronson, MD, MPH

At approximately yearly intervals, the Rhode Island Board of Medical Licensure & Discipline publishes a demographic profile of those physicians newly licensed to practice medicine in the state during the preceding year. This present report to the medical community, describing the 1994 cohort of new physicians, represents the fourth such summary to be published in this series.[1-3]

During calendar 1994, 234 allopathic physicians were granted licenses to practice in the state. An additional 11 osteopathic physicians were also granted licenses. The backgrounds of these latter physicians will be summarized in a later publication.

Gender and Age: Table 1 summarizes the age and gender distribution of these 234 physicians as well as comparable data representing the 1992 and 1993 cohorts of physicians entering medical practice in Rhode Island. The percent of entering physicians who are women has risen to 35.5%. This represents a significant rise over the percent of women established in the ranks of licensed physicians in recent years.[3]

The average ages of both male (37.6 years) and female (35.1 years) physicians in the 1994 group are greater when compared with new licensees of prior years. In each of the past 3 years the arithmetic mean male age has exceeded the average female age by about 1.9 years. This difference is attributable to the weighted presence of newly licensed physicians 50 years of age or older, virtually all of whom are male. The frequency of new licensees 50 years or older is clearly increasing: in 1992, 4.0% were in this category; in 1993, 6.2%; and in 1994, 8.1%. Some of these more senior physicians are now seeking Rhode Island licenses, not to engage necessarily in active practice but rather to administer health maintenance organizations. Indeed, because of the multistate nature of such organizations, these new licensees tend to maintain their main offices in an adjacent state while visiting Rhode Island only periodically.

Table 1.—Physicians Newly Licensed in Rhode Island By Age and Gender: 1992, 1993, 1994

Age Interval (years)	1992 male	1992 female	1993 male	1993 female	1994 male	1994 female
26-30	22	19	37	17	28	19
31-35	54	28	59	19	50	30
36-40	27	13	36	13	28	26
41-45	11	4	33	14	17	3
46-50	10	5	11	4	13	1
51-55	2	0	8	1	6	2
56-60	0	0	3	1	3	1
61-65	2	0	3	0	4	1
66+	4	0	0	0	2	0
Total	130	69	190	69	151	83
Average Age	36.5	34.2	37.3	36.3	37.6	35.1
% Women	34.7%		26.6%		35.5%	
Yrs since MD granted	9.7	7.3	9.4	7.3	10.4	7.1

The male licensees, on average, are 10.4 years out of medical school; the female licensees, on average, are 7.1 years out of medical school.

Many of the 1994 licensees are still in residency training at one or another of the teaching hospitals within this state. They have sought licensure because their formal training may involve them in some limited private practice or because some wish to be employed as substitute physicians ("moonlighting") during their free time.

Places of Birth: Table 2 summarizes the regions of birth of the 234 newly licensed physicians. Over half (55.6%) were born in New England or the middle Atlantic states. Fewer than one-fourth (21.4%) were born in New England, a slight drop from the 1993 percentage (23.9%) ascribable largely to a further drop in the number of native Rhode Islanders returning to their state. The frequency of United States-born physicians amongst the newly licensed, however, has risen. In 1993, the native-borns comprised 76.8% and in 1994, 80.8%. As was the case in 1993, more of Rhode Island's newest practitioners were derived from New York and New Jersey than from the six combined New England states. Rhode Island (7.3%) continues to rank third behind New York (19.2%) and Massachusetts (9.8%) in contributing its native sons and daughters to this state's physicians. Expressing it in more compelling terms, only one in 14 of the newly licensed physicians was born in Rhode Island.

In general, since 1975, there has been a steady, progressive decline in the percent of newly licensed physicians born overseas.

Medical Schools Attended: The geographic distributions of the medical schools

Table 2.—Physicians Newly Licensed in Rhode Island 1993 and 1994: Places of Birth

Place of Birth	1993	1994
Connecticut	8	8
Massachusetts	27	23
Maine	2	0
New Hampshire	1	1
Rhode Island	23	17
Vermont	1	1
New England, total	*62 (23.9%)*	*50 (21.4%)*
District of Columbia	5	4
Maryland	2	4
New Jersey	14	14
New York	56	45
Pennsylvania	12	13
Middle Atlantic, total	*89 (34.4%)*	*80 (34.2%)*
Southern States	16	15
North Central States	9	22
Midwestern States	13	11
Mountain States	5	1
Pacific States	5	10
Remaining States	*48 (18.5%)*	*59 (25.2%)*
Canada	*4 (1.5%)*	*2 (0.9%)*
Countries, other	*56 (21.6%)*	*43 (18.4%)*
Total	*259 (99.9%)*	*234 (100.1%)*

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attended by the licensed physicians of Rhode Island are summarized in Table 3. The data from four separate groups are provided: those physicians licensed before 1992; those licensed in 1992; those licensed in 1993; and those licensed in 1994.

While the percent receiving their MD degrees from one of the nine New England medical schools is stabilized at about 25%, the percent representing other US medical schools has risen from 46.6% of those licensed prior to 1992, to 60.6% of the 1994 contingent of physicians. The percent of US-Canadian medical graduates has risen to 85.9% in 1994. (US and Canadian schools are combined into one category because the medical schools of both nations are inspected by the same accrediting agency.) The number of graduates from Latin American and Caribbean medical schools, Asian medical schools and European medical schools has progressively diminished during the last decade. Prior to 1994, graduates of the off-shore Caribbean schools (exclusive of those Puerto Rican schools accredited by the Liaison Committee on Medical Education) constituted between 1.5 and 2.0% of the newly licensed. In 1994 this has dropped to 0.9%.

Table 4 ranks those medical schools which have contributed the greatest number of newly licensed physicians to the practicing pool of Rhode Island. The top 12 schools for those physicians licensed by Rhode Island before 1993, those licensed in 1993 and those licensed in 1994 are listed. Tufts, which for decades had provided this state with a plurality of its practitioners, has now given way to Brown in 1993; and, in 1994, both to Brown and to State University of New York (which represents four geographically dispersed campuses). In the past, Georgetown and Bologna have also served as traditional sources of Rhode Island physicians, but these schools have now been displaced by such medical colleges as Dartmouth, State University of New Jersey and the University of Massachusetts. All of the 12 schools for 1994, listed in Table 4, are situated in New England or the middle Atlantic region.

Licensure Pathway: As of 1994-5, Rhode Island law identifies four mechanisms by which a candidate's body of medical knowledge can be held to be above an established threshold. These four pathways are: (1) Certification by the National Board of Medical Examiners, Parts I, II, and III; (2) through state-managed FLEX examinations; (3) through Canadian province examinations; and (4) by a letter from the dean of medicine of Brown University stating that the candidate, having met all other stipulated requirements, is considered essential for

Table 3.—Physicians Newly Licensed in Rhode Island: 1992, 1993, 1994 Location of Medical Schools Attended

Medical School Region	Year of Rhode Island Licensure before 1992	1992	1993	1994
New England	693 (25.6)*	59 (29.4)	67 (25.9)	57 (24.4)
Mid Atlantic	793 (29.3)	54 (26.9)	82 (31.7)	78 (33.3)
USA, other	463 (17.1)	54(26.9)	50(19.3)	64(27.3)
Canada	54 (2.0)	3 (1.5)	10 (3.9)	2 (0.9)
USA+Canada total	*2,003(74.0)*	*170 (84.7)*	*209 (80.8)*	*201 (185.9)*
Latin America	147 (5.4)	9 (4.5)	13 (5.0)	4 (1.7)
Asia	158 (5.8)	10 (5.0)	10 (3.9)	7 (3.0)
Middle East	95 (3.5)	5 (2.5)	9 (3.5)	8 (3.4)
Africa	9 (0.3)	1 (0.5)	2 (0.8)	1 (0.4)
Europe, West	242 (8.9)	3 (1.5)	11 (4.2)	11 (4.7)
Europe, East	53 (2.01	3 (1.5)	5 (1.9)	2 (0.9)
Total	2,707	201	259	234

* Number, and in parentheses, percent.

Table 4.—Physicians Newly Licensed in Rhode Island 1993 and 1994: Medical Schools Most Commonly Attended

Licensed prior to 1993	Licensed in 1993	Licensedin 1994
Tufts	Brown	Brown
Brown	Tufts	State Univ NY
Boston	State Univ NY	Tufts
State Univ NY*	Boston	Boston
Bologna	Columbia	Columbia
Georgetown	Pennsylvania	Dartmouth
Harvard	New Jersey**	New Jersey
NY Medical	Dartmouth	Cornell
Vermont	Harvard	Vermont
Jefferson	UMass	UMass
Columbia	Jefferson	G Wash
Yale	NY Medical	NY Medical

* Represents graduates of four geographically separated medical campuses Brooklyn, Syracuse, Stony Brook, Buffalo).
**: Represents graduates of two geographically separated campuses (Newark and Rutgers).

Table 5.—Physicians Newly Licensed in 1992 - 1994: Licensure Pathways (in Percent)

Pathway	Age 35 yrs or younger	36+ yrs	All
1992 Licensees			
National Boards	79.5%	63.8%	73.4%
FLEX	18.9	33.8	24.6
Canadian	0.8	0.0	0.5
Dean's request	0.8	0.0	0.5
1993 Licensees			
National Boards	77.8%	61.7%	70.7%
FLEX	19.4	33.0	25.5
Canadian	0.7	0.9	0.8
Dean's request	2.1	4.4	3.1
1994 Licensees			
National Boards	78.7%	71.0%	75.2%
FLEX	20.5	25.2	22.6
Canadian	0.8	1.9	1.3
Dean's request	0.0	1.9	0.9

Table 6.—Physicians Newly Licensed in Rhode Island, 1993, 1994: Board Certification Status

	Licensed In					
	1993			1994		
Age	No.	% Boards	% 2 Boards	No.	% Boards	% 2 Boards
<36 yrs	184	33.7	5.4	127	35.4	12.6
36+yrs	75	80.0	20.0	107	71.0	18.7
Total	259	47.5	9.7	234	51.7	15.4

Table 7.—Physicians Newly Licensed In Rhode Island, 1993, 1994: Board Certification Status by Age, Gender and Site of Medical Education

Age, Gender & Site of Med. Education	No.	% Boards	% 2 Boards
<36yrs: (N=127)			
male, USMG*	68	33.8	5.9
female, USMG	49	36.7	2.2
male, IMG**	10	40.0	0.0
female, IMG	0	—	—
36+yrs: (N=107)			
male, USMG	57	87.7	55.6
female, USMG	27	59.3	14.8
male, IMG	16	43.8	6.3
female, IMG	7	42.9	0.0

*: Graduate of U.S./Canadian medical school
**: Graduate of an international medical school.

the educational purposes of the medical school and possesses certain unique investigative, academic or therapeutic skills which are not available to the state through customary channels. Table 5 summarizes the frequencies with which each of these pathways has been employed by Rhode Island's medical licensure candidates in 1992, 1993 and 1994. The great majority of new licensees enter practice via the National Board route (75.2% in 1994), and particularly those licensees younger than age 35 years. Canadian certification and special requests by Brown's dean of medicine continue to provide only negligible numbers of new licensees.

Prior Licensure: The application form for medical licensure in Rhode Island requires that the candidates indicate whether they hold active licenses in other states or jurisdictions. No prior medical licenses were held by 22.5% of male licensees and 32.5% of female licensees. On average, each male licensee held 1.52 prior licenses and each female licensee held 1.14 licenses. These gender differences may be explained, in part, by the somewhat fewer number of years since medical graduation for the female cohort, and therefore fewer opportunities to request licensure elsewhere. Another reason for this difference may be the substantially larger number of male physicians who engage in *locum tenens* type of practice, a form of medicine that requires the physician to hold multiple numbers of active state medical licenses. Some in this category hold medical licensure in as many as seven states.

Board Certification: More than half (51.7%) of the 234 newly licensed physicians in 1994 held specialty board certification at the time of their application to practice in Rhode Island. In 1993, this figure had been 47.5%. Furthermore, of the candidates applying for medical licensure in 1993, 9.7% had held board certificates in two or more specialties or subspecialties. This frequency rose to 15.4% in 1994. When these data are analyzed in terms of the age of the new licensees, a larger fraction below the age of 36 years are without Board certification since they may not have yet fulfilled the requirements to sit for these examinations (Table 6.) When these data are additionally segregated by age, gender and place of medical education (Table 7), the percent holding specialty boards is highest in older males educated in US medical schools. However, when these variables are analyzed in new licensees younger than 36 years, no significant distinctions in frequency arise.

Specialty Distribution: Table 8 summarizes the self-declared specialty distribution of the 234 physicians newly licensed in 1994, comparing these data with similar information derived from the 1993 cohort. The frequency of physicians electing to practice primary care medicine (see definition in Table 8) continues to rise, accounting now for 40.4% of newly licensed male physicians and 63.9% of newly licensed female physicians. The frequencies of those entering general surgery and the surgical specialties have diminished substantially in recent years. The percentages entering emergency medicine and the institutionally based specialties have not changed significantly since last year.

Observations: There are trends in these data which, if they persist in the years ahead, will represent notable departures in the profile of medical practitioners as well as in the logistics of their medical practice. Some of these trends are outlined briefly below:

1. The number of newly licensed physicians declaring themselves as solo practitioners has dropped precipitously.
2. The number of newly licensed practicing physicians who establish their offices in a hospital—or in offices adjacent to and managed by hospitals—is increasing.
3. The number of newly licensed physicians recruited directly by health maintenance organizations and operating un-

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der a full-time contract with them is increasing dramatically.

4. Some subspecialists with primary offices in adjacent states are opening branch offices within Rhode Island. Specialists in certain sought-after branches of medicine (eg, some forms of neurorehabilitation medicine) have applied for Rhode Island licensure in order to fulfill certain local health care needs. They plan to visit Rhode Island, at intervals determined by clinical demand, while still maintaining their primary practices in Massachusetts or Connecticut.
5. Some out-of-state physicians have recently obtained Rhode Island medical licenses to administer in-state health care institutions. Their primary base of operations, however, continues to be situated elsewhere. The mergers of facilities forming multistate health-care institutions now require that these physician-administrators visit the Rhode Island segment(s) of their conglomerate at periodic intervals, thus the need for Rhode Island licensure.
6. The fraction of newly licensed physicians who practice primary care medicine is now increasing, probably in response to identifiable socioeconomic pressures—and perhaps, also, to changes in the priorities of medical school admission committees.

Acknowledgement: The authors express their deep thanks to Robert J. Sullivan, Jr who organized the demographic and professional data concerning the licensed physicians of Rhode Island and who also created the necessary computer programs that allowed the retrospective analyses such as those described in this paper.

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Table 8.—Physicians Newly Licensed in Rhode Island During 1993, 1994: Distribution in Percent by Specialty, Age and Gender

Specialty	males				females			
	1993 all	1994 <35yr	1994 36+yr	1994 all	1993 all	1994 <35yr	1994 +36yr	1994 all
Primary care*	29.5	43.6	37.0	40.4	58.0	67.3	58.8	63.9
Non-surgical specialties**	26.8	14.1	30.1	21.9	14.5	16.3	11.8	14.5
Surgical specialties***	21.6	15.4	11.0	13.2	10.1	4.1	5.9	4.8
Emergency medicine	5.3	6.4	4.1	5.3	4.4	2.0	5.9	3.6
Institution-based specialties	16.8	20.5	17.8	19.2	13.0	10.2	17.6	13.3

* family medicine, pediatrics, obstetrics/gynecology, internal medicine without a defined subspecialty
** internal medicine subspecialty, psychiatry, neurology, dermatology
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Fatal Occupational Injuries in Rhode Island

Fatal occupational injuries are tragic not only for victims, their families and co-workers, but also for employers who are affected economically and emotionally. Nonfatal injuries also are significant because they are much more frequent and can result in long-term disability. The incidence of workplace injuries can be reduced by using data to identify high risk activities and jobs and subsequently implementing targeted health and safety programs.

In 1987, the National Academy of Sciences recommended that the Bureau of Labor Statistics work with individual states to collect comprehensive data on fatal occupational injuries using standard definitions and sources. In 1992, Rhode Island implemented this national Census of Fatal Occupational Injuries (CFOI) program, which now includes all 50 states and the District of Columbia.

For a fatality to qualify as "work-related," the decedent must have been employed (for pay, compensation, or profit) and must have been engaged in a legal work activity at the time of the injury. All injury-related fatalities, including deaths from falls, electrocutions, homicides, suicides, and traffic crashes while traveling for work, are included in the CFOI case definition. Sources of information include death certificates, workers' compensation reports, traffic accident reports, and reports from other government agencies.

During 1992 and 1993, on-the-job injuries in Rhode Island resulted in the deaths of 33 workers, an average annual rate of 3.4 per 100,000 employed persons aged 16 and over. This rate is 33% lower than the national rate of 5.1 per 100,000 for this period.[1,2]

Table 1.—Fatal occupational injuries occurring in Rhode Island, by age of decedent, 1992–1993

Age Group (yrs)	No.	%
16-19	0	0.0
20-29	8	24.2
30-39	11	33.3
40-69	14	42.4
Total	**33**	**100.0**

Table 2.—Fatal occupational injuries occurring in Rhode Island, by occupation and industry, 1992-1993

Occupation Group	No.	%
Precision Production, Craft and Repair	10	30.3
Operators, Fabricators, and Laborers	8	24.2
Technical, Sales, and Administrative Support	7	21.2
Other Occupations*	8	24.2
Total	**33**	**100.0**
Industry Group	**No.**	**%**
Construction	9	27.3
Wholesale and Retail Trade	6	18.2
Government	6	18.2
Services	4	12.1
Other Industries*	8	24.2
Total	**33**	**100.0**

* Other occupations include: Managerial and Professional; Service; Farming, Forestry, and Fishing; and Military. Other industries include: Agriculture, Forestry, and Fishing; Mining; Manufacturing; Transportation and Public Utilities; and Services.

The leading causes of fatal injury in Rhode Island over the 2 years were transportation and falls, followed by homicides, electrocutions, and fires/explosions (Figure 1). These were also leading causes nationally. Differences in Rhode Island and national percentages are not statistically significant due to Rhode Island's small numbers.

Males are at much higher risk than females of fatal occupational injury. Males comprised all 33 decedents in Rhode Island during 1992–1993 (average annual rate: 6.5 per 100,000), and 93% nationally. The age distribution of Rhode Island fatalities is illustrated in Table 1. Because of small numbers of deaths, age groups at elevated risk cannot be identified based on these data.

Occupations with the greatest number of deaths in Rhode Island were: Production, Craft and Repair; Operators, Fabricators and Laborers; and Technical, Sales and Administrative Support (Table 2). By industry, the greatest number of fatal injuries occurred in Construction, followed by Wholesale/Retail Trade and Government.

The CFOI program will identify more fatal occupational injuries in Rhode Island than before implementation. With the accumulation of several years of data, patterns will emerge more clearly, allowing effective interventions to be developed.

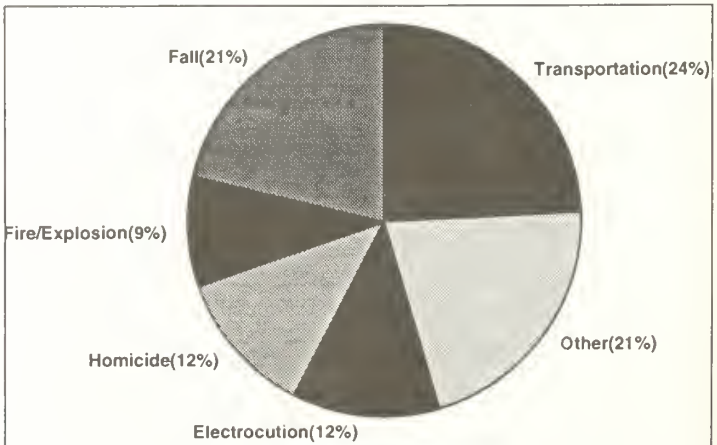

Fig 1.—Causes of fatal occupational injuries occurring in Rhode Island, 1992-1993 (N=33)

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Submitted by Matthew G. Lawlor, and Roberta A. Chevoya, Office of Vital Records. Health by Numbers *is edited by Jay S. Buechner, PhD, and William J. Waters, Jr., PhD*

Public Health Briefings

Rhode Island Department of Health
Patricia A. Nolan, MD, MPH, Director

Edited by Judith Feldman, MD,
John P. Fulton, PhD, and Bela Matyas, MD

Primary Care Physician Capacity in Rhode Island

Judith P. Feldman, MD, MPH John P. Fulton, PhD, Sharon Kernan, MPH

Under the aegis of the Rhode Island Primary Care Advisory Committee, the Rhode Island Provider Supply Task Force (Table 1) was established and convened in late 1992, "(t)o develop and propose strategies for increasing the supply of primary care physician providers in Rhode Island."[1] Recognizing the need for sound assessment in this area, the task force designed and implemented a mail survey of physicians most likely to provide primary care.

The questionnaire developed by the task force captured information on demographics, field of practice, hours worked, practice settings, services provided, and attitudes on selected issues. Respondents were also asked to note whether or not they considered themselves to be primary care physicians.

Rhode Island medical license records were searched to identify physicians in family and general practice, internal medicine (including subspecialties), pediatrics (including subspecialties), gynecology, obstetrics, and emergency medicine. Questionnaires were mailed to all 1701 physicians on this list. Seventy-nine percent of potential respondents returned questionnaires after three mailings. A telephone survey of a 10% sample of non-respondents found that most did not return the questionnaire either because they did not provide primary care or because they did not practice medicine in Rhode Island. Respondents who were not currently practicing medicine in Rhode Island and respondents who were currently physicians-in-training were excluded from further analysis, leaving 987 responses.

Table 1. Organizations Represented on the Rhode Island Provider Supply Task Force

American Academy of Family Physicians, RI Chapter
American Academy of Pediatrics, RI Chapter
American College of Emergency Physicians, RI Chapter
American College of Obstetrics and Gynecology, RI Chapter
American College of Physicians, RI Chapter
Brown University School of Medicine
RI Department of Health
RI Health Center Association
RI Medical Society
RI Society of Osteopathic Physicians and Surgeons

Estimates of the need for primary care physicians in the US were applied to Rhode Island and compared with estimates of the supply of primary care physicians from the 1993 survey, to assess the need for additional primary care physicians in Rhode Island.

Need

In 1991, Abt Associates published the report of a study commissioned by the US Bureau of Health Professions, Division of Medicine, for the Council on Graduate Medical Education, entitled "Examination of the adequacy of physician supply made in 1980 by the Graduate Medical Education National Advisory Committee (GMENAC) for selected specialties."[2] The purpose of the study was "to update the needs-based requirements model of GMENAC for seven physician specialties," including three essential primary care specialties, family and general practice, general internal medicine, and general pediatrics.[3] The crux of the report was summarized in a table entitled "National Needs for Physicians," in which the following ratios of primary care physicians per 100,000 population were presented for 1990:

General Practice	33
General Internal Medicine	28
General Pediatrics	11

These ratios are based on revisions of the GMENAC4 analyses, using the same modeling approach as GMENAC. The approach is described in the Abt report as "not a demand forecast; it yields requirements that are consistent with providing ideal levels and types of medical care, to meet the expected morbidity and wellcare needs of the population without regard to the typical barriers posed by ability to pay, access, availability, or ignorance."

Given the Abt report's ratios and Rhode Island's 1990 population of 1million, the state's estimated needs for selected primary care physicians in 1990 were 330 in family and general practice, 280 in general internal medicine, and 110 in general pediatrics.

Supply

In Rhode Island's 1993 survey of primary care physicians, 783 respondents described themselves as primary care physicians. Among them were 199 in family and general practice, 157 in general internal medicine, and 105 in general pediatrics.

Comparing estimates of need with estimates of supply, Rhode Island had a shortfall of 131 family and general practicioners, 123 general internists, and 5 pediatricians.

General Caveats

A few caveats are in order before discussing these findings:

1. The estimates of need and supply are crude. For example, estimates of supply do not differentiate between full-time and part-time physicians.
2. Compared to the US population as a whole (the basis of the Abt report's estimates of need), Rhode Island's older-than-average population probably needs higher ratios of physicians in family and

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general practice and general internal medicine to serve adults and elders, and possibly a lower ratio of physicians in pediatrics.

3. The contributions to primary care of residents and mid-level providers have not been considered in supply estimates.
4. Specialists other than those considered may provide high quality primary care to selected patients.
5. The GMENAC model refined by Abt Associates does not consider distribution of services, either socially or geographically.

Medicaid Managed Care

As managed care becomes institutionalized, greater patient management responsibilities and reporting requirements are placed on primary care providers. These burdens may be particularly acute for providers of Medicaid managed care. Patients in this system have significant health and social problems not as commonly found in the commercially insured population. Since children are the primary beneficiaries of Medicaid managed care in Rhode Island, the Abt-based estimate of need for general pediatricians in the state may be too small. Additionally, young women with Medicaid coverage traditionally have not sought primary care for themselves, and their entry into Medicaid managed care places additional resource burdens on the system of primary care for adults. The entire primary care system will need careful monitoring as managed care becomes fully implemented.

Discussion

From the perspective of the GMENAC model (as refined by Abt Associates), Rhode Island has far too few family and general physicians and general internists, and fewer than sufficient general pediatricians. Although the latter observation is debatable, given the crudeness of the estimates upon which it is based, the former is robust: Rhode Island probably needs substantially more adult primary care providers. Where shall we get them?

In the long term, Rhode Island may increase the rate at which it educates primary care physicians. Assuming we could attract the appropriate medical school candidates and provide them with effective incentives for choosing primary care practice, however, we would not begin reaping the benefit for another seven years. Even if we began with candidates for residency training, we would not begin reaping the benefit for another three years. Meantime, the population will have aged, and managed care will have become more widespread. The resulting need for adult primary care providers will most likely have increased. Furthermore, the state's capacity for training primary care physicians is low. The entire annual graduating class of the Brown University School of Medicine numbers only about 75. The number of residents trained annually in adult primary care specialties includes 13 in family practice and nine in general internal medicine. It would take many years to accrue an additional 250 adult primary care physicians. In short, Rhode Island must do much more than educate primary care physicians to reduce its shortfall in adult primary care capacity.

In the medium term, Rhode Island may increase the rate at which it educates primary care mid-level providers. Assuming we could attract the appropriate candidates for Rhode Island's one nurse practitioner training program and provide them with effective incentives for choosing primary care practice (roughly half of the advanced practice nurses and physician assistants trained in the US opt for specialty practice3),we would begin reaping the benefit in two years. Even though the state's present capacity to train primary care nurse practitioners is low (between 8 and 15 were graduated in each of the past three years), such training is considerably less resource-intense than physician training; therefore it is more expandable in the medium term. Nonetheless, it is estimated that one full-time mid-level provider in collaborative practice with a physician (the dominant mode of practice at present) increases the physician's capacity by 50%.[3] In short, it would take many years, even with expanded training capacity, to increase the number of Rhode Island trained adult primary care nurse practioners by 500.

In the short term, Rhode Island has two options. First, the state may increase the inmigration of primary care physicians and mid-level providers, by developing an attractive practice environment. Second, the state may increase the rate at which physician specialists choose to leave subspecialty practice for primary care practice, by developing effective recruitment incentives and opportunities for retraining. The need for retraining would depend on the level of primary care normally provided in subspecialty areas. Some subspecialists provide many primary care services, and therefore have few retraining needs.

The RI Provider Supply Task Force is considering all of these options. Thus far, focussing on primary care physicians, the task force has developed plans for education and training and for recruitment and retention. Other task forces, focussing on mid-level providers, are addressing similar issues, but thus far have not published reports. To their credit, the task forces are addressing supply and distribution problems simultaneously. Although both result in primary care shortfalls, solving one problem does not solve the other. The provision of accessible, comprehensive primary care is complex and will take many years and the work of the entire community to perfect.

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VOLUME 1
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THE RHODE ISLAND MEDICAL JOURNAL HERITAGE

90 Years Ago (July 1905)

The lead editorial expresses the gratitude of the Society for the enrichment to its medical library by Dr. H.G.Miller who, upon retiring, has donated his extensive collection of texts on diseases of the eye and ear.

A second editorial notes with pleasure that the Superintendent of Health has recently distributed enameled street signs bearing the legend, "Do not spit on the sidewalk. Fine, $20." Beyond its benefit to preventive medicine, declares this editorial, it obviates the legitimate objections to spitting by women who wear street-length skirts. On another matter related to the streets, the journal recommends that the "automobileur" should be required to "pass an examination in first aid to the injured and be obliged to carry in his hampers a minimum amount of bandages as well as cordials."

The President of Brown University, W.H.P.Faunce, LLD, provides the text of his address to the Medical Society entitled, "The Physician and the Community." Faunce first distinguishes the characteristics of a profession - as opposed to a trade - declaring: "Trade knows only the ethics of success; profession is bound by lasting ties of sacred honor." He observes, too, that "Society holds you (the physician) to a standard which it has never imposed on manufacturer, merchant, financier or even on officers of the municipal or national government. You are forbidden to advertise, whereas the main success of many a business man lies in shrewd self-exploitation." The main thesis of this learned oration is the need for basic research in medicine: "Happy are they who have been able to know the causes of things." On the one hand, the physician "at the end of 25 years of mending and patching may have blessed hundreds of individuals without making the smallest contribution to the science of right living." But on the other hand "the men who have discovered certain remedies for certain kinds of disease . . . have surely done more for humanity." Faunce concludes:" it is easy to see that the medical profession and the modern university can and should closely cooperate. At the basis of your profession is love of truth; at the foundation of our teaching is the same love of truth. We both recognize the personality of man as a unit. We do not believe that the mind belongs to the teacher and the body to the doctor. I am sure the zeal and skill and devotion of this medical society will help in linking the research of the university to the needs of the world."

G.W. van Benschoten, MD describes the case of a 33-year-old mill worker who presented to the hospital with headaches, left earache and purulent discharge. Surgery on the mastoid region tissues confirmed the diagnostic suspicion of a large abscess extending to the ipsilateral dura and the lateral venous sinus. The patient never regained consciousness and died the morning after surgery.

50 Years Ago (July 1945)

Frederick C. Irving, MD wrotes on the advantages and disadvantages of barbiturates in obstetrics. He concludes that barbiturates, with scopolamine, will produce satisfactory amnesia during labor in 85% of cases and 62% of babies will breath immediately at birth. There is no increase in fetal mortality with these agents. However, this combination (particularly with pentobarbitol) results in a higher frequency of respiratory complications than do demerol and scopolamine. Treatment of acute barbiturate poisoning, excitation caused by scopolamine and fetal apnea are carefully discussed.

C.A.Mills, MD, Professor of Experimental Medicine at the University of Cincinnati offers a paper on smoke and health. He emphasizes at the outset that the average adult circulates up to 12,000 quarts of air per day through his lungs. It is incumbent upon medicine, therefore, to know what substances are carried in this immense volume of respired air. In summary, the author demonstrates that a highly significant relationship exists between the extent of atmospheric pollution and respiratory disease death rates. This hazard (including carcinogenesis) is most evident in workers, particularly male, living in badly polluted industrial communities. "Remedial steps should include: (a) use of low volatile coal or proper equipment to burn high-volatile varieties smokelessly; (b) effective trapping of fly-ash in chimney or stack; (c) preliminary washing of high-sulphur coals; and (d) use by the railroads of Diesel or electric power within metropolitan limits."

C.O.Sappington, MD discusses the coordination of industrial medicine and industrial hygiene in modern industrial practice. He expresses the belief that there is a great need for more extensive use of the principles of coordination and integration in associating information and the reaching of more reliable conclusions regarding the causes and effects of occupational disease. Particularly, he pleads for the "development of more scientific medicolegal principles in the handling of compensation cases; and the further and continued enlightenment and training of engineers, physicians, insurance company representatives, attorneys, industrialists, industrial commissions, and their associates through periodic conferences, meetings and lectures."

One of the editorials discusses the need for (and the ramifications of) food rationing. The *Journal* also provides, in tabular form, the maximum weekly supplemental food allowances for those suffering from various illnesses or physiologic states (eg, diabetes, tuberculosis, pregnancy.)

Captain Edward Ricci, MC of North Providence, a physician with the American troops

liberating slave labor and concentration camps within Germany, describes in detail the horrors and atrocities caused by the Nazis which he personally beheld. "People back home should know these things."

25 Years Ago (July 1970)

Drs. A.A.Savastano, S.J.Kamionek and J.H. Navach describe a fatal case of osteomyelitis caused by *Salmonella braenerup.* The patient was a 90 year old diabetic woman who had sustained an impacted fracture of her right humerus. The patient's death,weeks later, was attributed to Salmonella sepsis, myocardial infarction and renal tubular necrosis. In searching the medical literature, the authors were unable to find any other case of osteomyelitis caused by this bacillary species.

Charles Millard, MD discusses the therapeutic dilemma posed by pulmonary emboli during the first trimester of pregnancy and the possible adverse effects that anticoagulant therapy may impose upon both the mother and the developing fetus. He illustrates these issues by a case report.

Potassium therapy and gastrointestinal lesions are discussed by David Emerson, PhD. "Small bowel lesions associated with enteric coated KCl-thiazide preparations are caused by the KCl component of the tablets. The lesions are characteristically nonspecific and circumferential, and consist of stenosis with or without ulceration. The reported incidence is approximately 1 per 100,000 hospital patients."

Henry M. Litchman, MD discusses the challenge of biomedical engineering in the field of orthopedic surgery. "Programs must be developed with a unique identity that would provide basic core curricula in both physical and life sciences to develop engineering specialists whose primary disciplinary orientation is the human system."

Four cases of leiomyoblastoma of the stomach are presented by Drs. P.A. Broderick and S.R. Allegra. Emphasis is placed upon the relatively benign clinical course of these neoplasms.

J. Vidal, MD and V. Bainton, RN, describe a community hospital-based home care program, demonstrating that lowered costs can be achieved for certain disabilities and illnesses.

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COMMENTARIES

Enduring Partnerships

The University of Vienna was created by papal decree in the year 1365. It flourished largely as a center for the study of theology and canon law until a plea had been made for a separate faculty of medicine. The academic physicians sought for themselves a status higher than that of the itinerant quacks with whom they competed; also they yearned for a secure place amongst the established guilds of the city, and above all a stable and visible identity. Accordingly, one of their first acts was to seek out a patron saint to provide them with a cloak of historic continuity. They ultimately chose not one but two: Saints Cosmas and Damian.

These two Christian brothers, said to be twins, were slain in Cilicia during the reign of the Roman emperor Diocletian in the year 303 AD. Little is known about them but by tradition they are said to have been born in the Arabian peninsula. During their brief lives, Cosmas practiced medicine without charging fees and Damian dispensed medications. Paintings sometimes show Cosmas examining the translucency of a urine specimen (uroscopy) while Damian carries an apothecary jar beneath his arm (see illustration). Their martyrdom in defense of their faith won them eventual sainthood, but it was not until centuries later that their alliance with the healing arts came to the fore. They then assumed a special role as the twin patron saints of the physicians (Cosmas) and apothecaries (Damian). The apse in the Church of Sts. Cosmas and Damian, completed in Rome in the year 530 AD, shows a young Cosmas carrying both a medical instrument case and the symbolic wreath of martyrdom, while being comforted by St Peter. A portrayal of Cosmas without Damian is unusual. In virtually all graphic illustrations, the twins are shown as inseparable. It was during the 14th to 17th centuries that their fame reached its zenith. Numerous churches constructed during this era commissioned mosaics and paintings of the healing twins and many European medical schools illuminated their academic banners with their portraits.

In some of the sacred paintings the twins seem to be engaged in the treatment of leg disease or leg injury, perhaps reflecting their most notable therapeutic deed. Tradition says that they were once confronted by a white man gravely ill with abscesses of his left leg. The twin brothers then amputated the diseased leg and successfully replaced it with a healthy leg derived from an African. (Legend does not disclose any further details regarding the donor or whether the donor leg was voluntarily relinquished.) This story of limb transplantation was so well ingrained in illiterate circles that a mere graphic representation of a white adult with one dark-skinned leg was understood to signify the sainted twins. The name of the altruistic donor is lost to history.

Twin births occur about once in every 89 full-term pregnancies. Twinning, an unusual event by any standard, has always been endowed with special societal properties. In some cultures twins were destroyed at birth; in others, they were revered and prepared ultimately for priesthood. Each twin, at times, has been viewed as emblematic of one or another distinguishable life force while his sib has been assigned to the alternative force: light or dark, altruism or venality, good or evil. In far east mythologies, the duality of twins becomes more complex; each of the twins is commonly invested with qualities which are independent and complementary rather than antagonistic and mutually exclusive. Whatever the perception of twinhood in earlier cultures, people were ever sensitive to their unique status. They were thought of as something alien but irrevocably coupled, much like binary stars each eternally in the gravitary grasp of the other. Indeed, to break this mutual spell, certain European societies regularly separated twins at birth, each to grow up far from each other and unbeknownst to the other.

The most prominent pair of twins is found in Greek mythology. Leda marries Tyndareus, king of Sparta

and she bears him twin sons called Castor and Polydeuces, and simultaneously, two daughters named Helen and Clytemnestra. It is widely whispered that Zeus fathered one or both of the twin boys (in Greek mythology, paternity claims frequently derive from unnamed sources). But in strong support of this rumor is the fact that the Athenians refer to the male twins as the *Dioscuri*, Greek for those born of the gods). The twins grow up and become the pride of Sparta as brave warriors, adventurers, tamers of horses and matchless athletes. After many brave deeds, the inseparable twins encounter the rapacious Calydonian hunters and courageous Castor is impaled upon the spear of Idas. Polydeuces takes full revenge but then becomes inconsolable. In his grief he begs Zeus to be reunited with his brother. Zeus relents and allows them to divide their time eternally between Hades and Heaven; and while they are in the heavens they are to be represented by two bright stars ascendant in late spring. The Romans absorb the touching fable of the loyal brothers, calling them now Castor and Pollux and renaming the zodiacal constellation *Gemini* (Latin, the twins). Over two millenia later when NASA strives to provide a name for their space flights involving two astronauts, they naturally choose Gemini.

Certain general characteristics seem to prevail in mythic stories of twins: They are always male, and customarily of royal or sacred lineage; they are resolute and courageous warriors, each with complementary talents, boldly confronting powerful enemies; they maintain a closeness to each other usually eschewing heterosexual contacts; and one typically dies before the other, usually in early adulthood; the remaining twin then prevails upon the gods to bring them together again. The tale of Cosmas and Damian departs somewhat from this formula. The healing twins practice a peaceful, enobling profession; and martyrdom rather than death in noble battle becomes their fate.

Enduring partnerships are exceedingly rare and whatever their composition they deserve to be celebrated, particularly if they confer patronage to a great profession. Of course such partnerships need not be based upon twin birthing or indeed upon any biological relationship between partners. Nor is tenacious loyalty a quality confined to males. Ruth, the Moabite, says to the widowed Naomi: ". . . for whither thou goest, I will go; where thou lodgest, I will lodge; thy people shall be my people, and thy God, my God." History has recorded with admiration the abiding loyalty and devotion which partners, mythic or real, have displayed to each other (such as David and Jonathan or Damon and Pythias). But in their very closeness partners may sometimes face a new peril when their identities become confused with and dissolved into the personage of the other. Which one, for example, was Laurel and which Hardy? Was it Gilbert or was it Sullivan who composed the immortal lyrics? Who was on first, Abbott, Costello—or perhaps Tinkers, Evers or Chance? And what accomplishments distinguished Bailey from Barnum? Lewis from Clarke?

Medicine has also celebrated its partnerships such as Cosmas and Damian. But by tradition, and by the nature of interpersonal responsibility, medicine has always been a profession that operates best when individuals rather than groups assume accountability. No great poem or immortal symphony has yet been fashioned by a committee.

Stanley M. Aronson, MD

Should the Words Sin and Shame Be Revived?

> Use everyman after his just desert, and who should 'scape a whipping'?
>
> Shakespeare: *Hamlet, Act II, Sc. 2.*

When my classmates and I were introduced in earnest to Greek mythology in the 7th grade, our teacher told us quite seriously that the Greeks had no idea of sin; our teacher, caught up in the progressivism of the time, of course, was wrong. The Greek word *hamartia* signified not only failure, missing the mark, but a wrong act, a sin against a divine commandment.

Several years ago some nurses and I were watching a video dealing with medical ethics; in it the surgeon general C. Everett Koop acted out an encounter with a teenager who had come to him for a contraceptive prescription. He listened patiently to her request, asked if she had thought it through carefully, and urged her to return after office hours so he could talk with her about a better way. The nurses were offended that he had even implied that her request was inappropriate, and further that he would try to impose his values on her, perhaps, heaven forbid, making her feel ashamed!

In 1973 Karl Menninger wrote a book that enjoyed moderate popularity, *Whatever Became of Sin?*[1] He observed that the last American president to mention sin publicly was Dwight Eisenhower when he proclaimed a national day of prayer in 1953; he borrowed his prayer from Abraham Lincoln's prayer of 1863:

> It is the duty of nations as well as of man to own their dependence upon the overruling power of God, to confess their sins and transgressions in humble sorrow, yet with assured hope that genuine repentance will lead to mercy and pardon.

"So as a nation," wrote Menninger, "we officially ceased sinning some 20 (now 40) years ago." Crimes, of course, remained; some sins turned into crimes, others into medical problems, but with these transformations, shame pretty much disappeared, and guilt feelings became pathological. The demise of sin coincided closely with the sexual revolution. There is no denying that those of us who were adolescents in the 1930s defined sin mostly as failure to live up to fairly rigid standards of sexual morality. Our parents and teachers had been middle-class Victorians and Edwardians for whom their Roaring Twenties had been a delightful aberration, hardly to be taken seriously as a revolution, sexual or otherwise.

The dominant ethos then was middle-class morality, the very morality that the medical historian Oswei Temkin invoked to explain the decline of venereal disease beginning in the late 18th century. Bourgeois society, then coming into its own, saw syphilis as "a sign of the moral degeneracy of the single individual who has transgressed the laws of the moral world . . . Disease (syphilis) was now forgiven no-one, whether aristocrat, bourgeois, or peasant. For one and all it spelled disgrace."[2]

As the detective-story writer Dorothy Sayers reminded us, *luxuria* or lust is but one of the seven deadly sins. I suspect it is a fair indicator, when it runs rampant, that the other six are out of their cages as well. A judge, reflecting on the failure of the liberalism that he had so long espoused, said that too many of our fellow citizens have lost their sense of responsibility and self-control. Adolescent sexual activity, now exceeding 50%, with its resulting increase in illegitimate births to teenage mothers is a judgment on irresponsible parents in a permissive culture.

Senator Daniel P. Moynahan, speaking of this epidemic, unique to our time, remarked recently that "We have learned how little we know and how much we have denied our failure." Only to mention this matter a few years ago was to be scorned at best as an outmoded moralist, and at worst, a racist.

Shame is the only reliable corrective. Social engineering and making laws may reinforce, but they do not cause responsible behavior. Moral renewal is not something that job training and eliminating poverty can guarantee. A society in which shame and guilt have become feelings to be ashamed of is a society in steep decline. "I have pursued the possible usefulness," wrote

Dr. Menninger, "of reviving the use of the word 'sin'—not for the word's sake but for the reintroduction of the concept of guilt and moral responsibility."

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Robert U. Massey, MD

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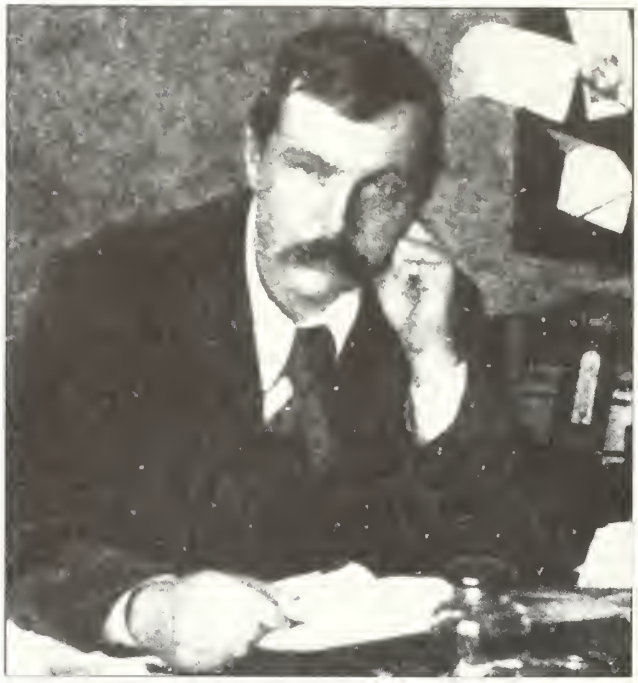
The Physician Who Invented 221B Baker Street

"In the year 1878 I took my degree of Doctor of Medicine at the University of London and proceeded to Netley to go through the course prescribed for surgeons in the army." So begins the reminiscences of John H. Watson, MD, late of the Army Medical Department. The novella, called *A Study in Scarlet*, relates details of his brief career in the Second Afghan War, his shoulder wound, and his slow convalescence back in London, ". . . that great cesspool into which all the loungers and idlers of the Empire are irresistibly drained."

Seeking a residence, Watson encounters a former colleague from St Bartholomew's Hospital who tells him of an acquaintance—a curiously singular chap—also looking for lodgings. A meeting at the hospital's chemistry laboratory is scheduled for the next day. As Watson enters the laboratory a tall stranger exclaims "I've found it! I have found a reagent which is precipitated by haemoglobin and by nothing else." Under such precipitous circumstances does Watson meet his future roommate, Mr Sherlock Holmes. They jointly agree to share a flat at 221B Baker St. A tale of nefarious deeds on two continents then unfolds. The story, published in December 1887, was authored by an obscure 27-year-old Plymouth medical practitioner, one Arthur Conan Doyle, MD.

The many Sherlock Holmes tales which followed are primarily adventure stories but imbued nonetheless with a deep morality and unwavering patriotism. Not much medicine gets practiced in these stories except for Watson either confirming the death of some victim or attending the immediate needs of a swooning lady. And except for the mysterious Irene Adler and some tangential mention of a Mrs Watson, women are rarely encountered in these tales except as supplicants or potential clients.

Doyle was born in Edinburgh on May 22, 1859, son of a remote, neurologically impaired father and a stern, disciplined and well educated mother. The Doyles, two generations back, had migrated to Scotland from the Wexford region of Ireland; the family, some 6 centuries earlier, was from Pont d'Oilly, near Rouen, in Normandy. Over the years, the Doyles provided Britain with some of its most illustrious graphic artists. Doyle's first name, Arthur, was chosen by his mother, a woman obsessed with tales of chivalry. He described his childhood as grim and cloistered, and his education entirely parochial. Nevertheless he grew up strong, self-reliant and immensely athletic. As a youth he attended a Jesuit school in Lancaster where his favorite authors included Scott, Macaulay and the American, Oliver W. Holmes. In 1877 he entered Edinburgh University intent upon a medical career. During his clinical years he was most impressed with the eminent Joseph Bell, MD, famed for his deductive capacities, and Professor Andrew Maclagan, the local authority on forensic sciences. Doyle's medical education was harshly austere but competent. Years later when talking about his alma mater, he said: ". . . if she be a mother at all, she is one of a very stoic and spartan cast." Edinburgh awarded him the bachelor's degree in medicine August 1881.



In 1880, while still a medical student, Doyle signed on as ship's surgeon with an arctic whaling vessel, a tour of duty lasting 7 months. Following graduation from medical school he took employment as a surgeon on a cargo vessel to the African west coast. In Lagos he developed typhoid fever, returning to England the following January to recuperate. He finally established a modest general practice in the coastal city of Plymouth where his highest annual income never exceeded 300 pounds. A general practice such as his inevitably included the observation and care of infants and young children. Doyle periodically treated infants with vomiting, pailor and muscle weakness which he correctly diagnosed as lead poisoning incurred by the chewing of freshly painted cribs. He undertook a modest campaign to warn mothers of this great hazard. At one point, when his practice languished, he decided to specialize in ophthalmology and invested 6 months in postgraduate training at a Viennese eye clinic.

Doyle's practice, general or ophthalmologic, never really established itself. This allowed him time to write pieces of fiction, most of which were rejected. His 1887 attempt at a detective story, however, proved immensely successful and two immortal characters—John Watson, MD and Sherlock Holmes—were thus born. The demand for new Sherlock Holmes tales became insatiable, both in England and the United States, and Doyle became an international celebrity.

Were there historic roots for these two characters? Watson, a failed physician, bore some resemblance to Doyle. Some of the elements making up Holmes are more obstruse but can also be identified. The name, Holmes, was a conscious homage to Doyle's idol, the great physician-poet from Massachusetts, Oliver Wendell Holmes. Sherlock, on the other hand, was an eminent family name in the Irish counties of Wexford and Wicklow, places where King Edward III had given estates to the ancestral Norman family of the d'Oyles.

Twelve years passed, busily invested in the creation of more Sherlock Holmes tales, before Doyle resumed the practice of medicine. England was now engaged in a new war in South Africa, fighting the Boers. Doyle, 40 years of age but still robust, volunteered as a military physician, his hospital unit finally stationed in the interior African township of Blomfontein. A dysentery epidemic raged and his field hospital was devoted largely to the inpatient care of civilian patients, including Doyle himself. At one point, Doyle shared his quarters with

a youthful English war correspondent named Winston Churchill. Within months Doyle retreated to England.

Doyle returned then to civilian life and tried vainly to kill off Sherlock Holmes. He had lost interest in the famous detective while becoming deeply immersed, instead, in the intricacies of mysticism and the spirit world. For three decades he invested his genius and funds in attempts, through seances, to establish communication with the intangible world beyond. He continued his periodic lecture tours and reaped immense profits from the sale of his books, now printed in 41 languages.

In the early spring of 1930, while lecturing on the continent, Doyle developed anginal pains. Despite prolonged rest on his English estate, he passed away on the morning of July 7, 1930. He lies in the Minstead churchyard, the epitaph on his tombstone saying simply: "Patriot, Physician and Man of Letters," medicine comfortably ensconced between two eminently Anglican virtues.

Other than Watson's near constant presence as Holmes' Boswell, is there something peculiarly "medical" in the Sherlock Holmes stories? Holmes was portrayed as singularly aloof, unemotional, somewhat misogynous and invariably professional—qualities that might accurately have described the Victorian physician with offices on Harley St (which, incidentally, is but a few blocks from Baker St). Clients did not purchase things from him as though he were a tradesman; rather, they were permitted to consult with him. Furthermore, he characteristically dissected the presented problems into their objective elements, seeking commonalities with the details of prior crimes maintained as his personal case records; and finally there was his reliance upon laboratory analysis. Rarely was his unflagging belief in the rational basis for puzzling events ever placed in doubt. This was the quintessential *fin de siecle* consulting physician—or pathologist. When, however, a client needed to be comforted or consoled, it was Watson who opened his heart. Holmes and his intellect were committed only to the problem, never to the distress of the client. Indeed, except for some moody violin scratching, isolated episodes of cocaine addiction and rare mutterings about Irene Adler, there was no earthly Holmes visible to the reader other than this dazzling intellect.

Conan Doyle, physician and writer, was knighted earlier this century. When learning this, Christopher Morley observed: "How ridiculous that he was only knighted. He should have been sainted."

Stanley M. Aronson, MD

LETTER TO THE EDITOR

To the Editor:

Now that I am getting up in years, I find myself spending more and more time in doctors' waiting rooms. In 5 out of 6 of them in which I have been obliged to wait in the past year, I was dismayed to notice books promulgating the fundamentalist Christian religion.

These evangelical publications are from the Seventh Day Adventist Book Store in South Lancaster, MA. They usually carry a bright orange sticker saying "OFFICE COPY. DO NOT REMOVE FROM WAITING ROOM." The most common book is The Bible Story by Arthur S. Maxwell, but sometimes one finds Uncle Arthur's Bedtime Stories. The latter contains tales of angels, heaven, the resurrection, and how prayers are always answered. Written in simplified language, and lavishly illustrated, these books are clearly targeted at children. Because they are placed selectively in doctors' offices, they are obviously intended for a readership likely to be sick and vulnerable.

Medical buildings usually display "No Soliciting" signs, but this does not deter whomever distributes these religious books from soliciting converts among the doctors' clientele. They would seem to be taking advantage of Rhode Island physicians and dentists, many of whom are apparently unaware of how they are being used.

The first time I encountered one of these books I dismissed it as an exceptional case. The next time I became suspicious. When it happened three times in a row, I knew there was a pattern. As James Bond said, "Once is a fluke, twice is a coincidence, three times is enemy action."

Nevertheless, data from only half a dozen doctors' offices was a pretty small sample. Ever the scientist, I took the trouble to check out 100 waiting rooms from Woonsocket to Newport to see if my preliminary findings were indicative of a general trend. Forty-two percent of them contained religious books. Inasmuch as many waiting rooms served multiple physicians, a very large number of the state's doctors are unwitting partners in this kind of religious proselytization.

It is well known that evangelical Christians consider it their sacred mission to save as many souls as they can. But in their overzealous efforts, is it moral to prey upon the young and the infirm? Religion in general is not well served by this kind of intrusion into secular life. However pure they may believe their intentions are, could there not be a hidden agenda? The answer lies right inside the front covers of their books.

Each one of these volumes contains a packet of business reply cards you can send in to find out now to obtain 10 volumes of The Bible Story, 5 volumes of Uncle Arthur's Bedtimes Stories, and 5 volumes of My Bible Friends. If you think these books are free, think again. For only $427.50, you can purchase the entire lot. And there is no sales tax because they are sold by a tax-exempt church.

Clearly, if the doctors of Rhode Island are unaware of what is going on, then they are being snookered. They are allowing their waiting rooms to be used to sell religious merchandise to their patients, a dangerous precedent that might also appeal to politicians, drug companies, and miscellaneous sales reps (not to mention other religions out to seek converts). Some medical personnel adamantly turn away anyone who approaches them to deposit material in their waiting rooms. Others, however, feel they are doing their patients a service by providing messages of hope or consolation. There seems to be a common perception that just because something is religious it must therefore be moral and good.

I would hope that my physicians were men and women of science, not superstition. Whether they are personally religious or not, their patients surely have the right to expect them to practice their medicine ethically and in accordance with established procedures. Yet by allowing antiscientific books in their waiting rooms, books that negate much of what they learned in college and medical school science courses, are they not violating the principle of truth in advertising?

Dear doctor, won't you monitor your waiting rooms more carefully? Don't just leave it up to your receptionist. Why not consider replacing the religious tracts with quality books on, say, pioneers in medicine, marvels of nature and modern science, or health care and preventive medicine? Such books as these will tell your patients that you consider the principles of science more reliable than superstitious tales from ancient times. After all, what is displayed in your reception area reflects your attitude toward medicine—and your patients.

Richard J. Goss, PhD
Robert P. Brown Professor of Biology Emeritus
Brown University

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Capital Punishment and the Physician: The Views of Six Rhode Island Physicians

James P. Crowley, MD, Michael A. Ingall, MD, Frank M. Kahr, MD,
William Braden, MD, Melvin Hershkowitz, MD, Herbert Rakatansky, MD

RHODE ISLAND MEDICINE, the monthly journal of the Rhode Island Medical Society, assigns most of its issues to subjects believed to be of immediate, compelling professional interest to the practicing physicians of the state. Such issues may be strictly medical or, rarely, they may concern certain social problems that touch upon the integrity of medicine. The issue of capital punishment and the role—if any—that physicians might play in carrying out such mandated executions, is now actively debated in Rhode Island. It is an important issue and certainly an appropriate one for our journal to address.

In reality, there are two questions to be considered: first, whether Rhode Island physicians are in agreement with the unequivocal stand taken by the American Medical Association (AMA) concerning any active role fulfilled by physicians in state executions:

[Policy Compendium, 1994, 1440.968]: Physician Participation in State Executions: [1] The AMA urges all state medical societies to [a] reaffirm that physician participation in executions, except to certify cause of death, is a serious violation of medical ethics, and [b] examine their state criminal codes to ensure that physician participation in executions is not required by law, except to certify cause of death. [2] The AMA urges all state medical societies whose state criminal codes involve active physician participation in executions to engage their state's legislative process to change the pertinent codes. [Res. 163, A-91]

And second, whether Rhode Island physicians, as private citizens, advocate the reestablishment of the death penalty for certain major criminal offenses in the state, whether or not they are called upon to participate in carrying out the sentence.

The recently revived debate on whether this state should reenact legislation permitting capital punishment coincides, curiously, with the 150th anniversary of the public hanging of John Gordon who on February 14 (Valentine's Day), 1845, was the last human being to be put to death by this state. In 1852, 7 years later, the Rhode Island legislature voted to abolish capital punishment except for murder committed by a prisoner serving a life sentence.

In this section of the journal, six Rhode Island physicians express their personal views on capital punishment. Readers of RHODE ISLAND MEDICINE are urged to submit their personal opinions on this issue.

* * *

James P. Crowley, MD:

For the first time in more than 20 years the RI General Assembly has before it a bill to re-enact the death penalty. Sponsored by prominent members of the House and Senate, the bill was entered at the request of the Attorney General and is strongly supported by the Governor. Angered by a spate of cruel and senseless murders locally and across the country, many of the electorate at this point also seem to support this bill. A state with a low homicide rate, Rhode Island has not executed a person in more than 150 years following the hanging of an Irish immigrant for a crime he in all probability did not commit.

Rhode Island's last execution occurred on St. Valentine's Day, 14 February 1845. The condemned prisoner was named John Gordon. The crime for which he was executed was the brutal murder of a prominent Cranston mill owner, Amasa Sprague, on Dec. 31, 1843. Amasa Sprague's brother Senator William Sprague had been a leader in the "Law and Order" party that had put down the Dorr War, Rhode Island's vest pocket civil war fought over the issue of universal suffrage in legislative elections in 1842. This civil war was brought about by the antiquated voting laws of Rhode Island that still functioned under a charter from Charles II issued to Roger Williams in 1663 blocking all but property-owning white males from voting in general elections. John Gordon had immigrated early from famine-threatened Ireland and settled in Cranston with his brother Nicholas. His brother had purchased steamship fares not only for him, but also his brothers William, John, Robert and the 7–year–old daughter of his brother William, as well as his aged mother, Ellen, and his sister Margaret, all arriving in July 1843. A month before their arrival, alleging that liquor sold in Nicholas Gordon's general store might affect the production in his textile mill, Amasa Sprague blocked the renewal of Nicholas Gordon's victualling license. Lurid press stories, fed the general feeling in Rhode Island that some member of the family had wantonly killed Amasa Sprague because of his adament opposition to their brother's store. They were all initially suspects although only one of the brothers, John, was eventually charged. The investigation took place amid a charged atmosphere of intense anti-Irish and anti-Roman Catholic prejudice fomented by the establishment of the time who had been threatened with a substantial weakening of power by the popular Thomas Dorr and his Labor supporters. The trial that followed may have been a travesty of justice.

The state's case against the Gordon family was entirely circumstantial. The eventual charges brought against the brothers for the killing of Amasa Sprague encountered difficulties. Nicholas had an iron clad alibi on the date of the murder. His brother William, similarly charged, was dismissed because of strong corroborating evidence he could not have been on the scene of the crime. John Gordon then alone stood accused. It seems he was convicted of the crime mainly because of his inability to establish any alibi.

John Brady a Roman Catholic priest who was with him on the morning of his execution, urged him to: "Have courage John, you are going to join the noble band of martyrs of your countryman, who have suffered before the shrine of bigotry and prejudice." Gordon replied ". . . I forgive them for they know not what they do." Later evidence would show that the killer's foot prints around the body of Amasa Sprague were much larger than those of Gordon's. Every published study of this crime in the 19th and 20th centuries has concluded that Gordon was not the person who bludgeoned Sprague to death. Long before these studies were published the general public and their elected officialdom in Rhode Island had concluded that John Gordon was wrongly executed. The RI General Assembly, in an effort to acknowledge the injustice of Gordon's death, enacted a law soon after his execution prohibiting the death penalty in Rhode Island.

Capital punishment has been reconsidered from time to time in Rhode Island, especially when the public perceived an increase in crime and especially if that crime

was homicide. Arguments about deterrence were raised but in recent years this argument has not been heard as much as the argument for the reinstitution of the death penalty as a means of retribution although the present governor argues the point that reinstitution of the death penalty is an absolute deterrent to another crime by the executed criminal. The present bill, if passed, would put before the electorate a constitutional amendment for their approval that would re-introduce the death penalty in November of 1996. Since the death penalty could involve execution by lethal injection supervised by a physician, this proposed law is of particular concern to physicians.

Widely used in veterinary medicine as a method of humane euthanasia for many years, lethal injection of condemned prisoners was first used as a method for legal execution in Texas in 1982, a state that has executed more prisoners than any other. Today, it is the specified method of execution by the federal government and 14 other states. In some states such as California, it is required that physicians participate in the execution in various ways. Sometimes this is in a voluntary manner and other times it is a job requirement. The AMA studied this practice in the 1980s and issued a strong opinion, considered binding on its members, allowing that while physicians could accept capital punishment they, nonetheless, were prohibited from involvement in capital punishment except for certifying the prisoner dead. This denunciation was reaffirmed and further refined in a 1993 council report that was subsequently published in *JAMA* that same year. However, legislators have generally refused to enact this position into law despite AMA requests. The reason for this is the fear that allowing physicians to opt out of executions would lead to the overturning of execution by lethal injection by the courts because in the absence of physician involvement this type of execution it might be seen as a "cruel and unusual punishment" prohibited by the Constitution. Despite the strong denunciation of physician participation in any form of execution by the AMA and other physician groups, some physicians have willingly participated in executions and argued their position was ethical. The California Medical Association, which initially supported the AMA position, has lately reversed itself stating that state-employed physicians are not acting unethically since they have no moral culpability if the state orders them to participate. This position is remarkable coming from a state that lost so many sons and daughters in a war that was fought, among other things, to establish the opposite ethical principle 50 years ago. A more understandable argument for the ethically acceptable participation of physicians in executions that has been made is that the presence of a physician is preferred by the condemned prisoner who believes the physician to be a trusted advocate. The physician would see that the prisoner was not subjected to unnecessary pain or suffering. Moreover, the physician's superior technical skills would ensure that the execution would not be botched by those with less training.

So now for the first time in 150 years, Rhode Island physicians may have to confront this thorny ethical question joining many perplexed physicians in the other 38 states where capital punishment is now legal. How should this issue be addressed? The RI Medical Society's position is that it subscribes to AMA policy since no local position has been developed that differs from the AMA. So will members of the RIMS be dropped if they participate in executions, whether voluntarily or not? Might some physicians face loss of their license for unethical behavior? Should RIMS adopt the position of the California Medical Association and exempt physicians employed by the state? One solution that has been suggested by the legislature is to remove some of the ethical problems for physicians in the use of the gas chamber, which, while painful for the observers (not to mention the condemned), does not require any medical skills. This solution would deny to the prisoner the more humane death of lethal injection

I believe Rhode Island physicians must oppose the passage of this law to reinstitute capital punishment if we are to ensure that physicians are not to be put in the position of assisting in the killing of prisoners who look to physicians to be their most trusted advocates. I will not expand on the oft repeated and familiar moral arguments against state killing or the studies that have shown that no deterrent effect exists. But it seems clear that unexpected outcomes may follow. Manhattan's district attorney recently opined that mandatory death sentences have resulted in murderers going free because of the great reluctance of juries to be the instruments of someone's death. Prosecuters have reduced charges for the same reason. There is an economic argument not often mentioned in discussions about capital punishment that is significant. Of the 3000 persons who are currently on death row throughout the country, virtually all of them are in various stages of expensive legal appeals. Contrary to popular wisdom, it has been estimated that each condemned prisoner costs the state $2 million more in legal and penal costs than a prisoner simply condemned to life without parole. Moreover, only about 250 of the nearly 3000 on death row have been executed: less than 10%. While having a minor effect on the actual execution rate, the passage of the death penalty ensures more work for the legal profession and judiciary and guarantee of increased costs to taxpayers. If the electorate approves this amendment, many physicians will agree with the unambiguous position of the AMA that denounces as unethical participation by physicians in executions. Others will wonder if it is right to put a higher value on our own professional dignity than on the needs of condemned prisoners who trust physicians to ease their suffering and ensure no unnecessary pain accompanies their deaths. The best way out of this dilemma is to let the legislature know that physicians do not support reinstitution of the death penalty in Rhode Island.

(Dr Crowley is professor of medicine at Brown University School of Medicine, chief of the Division of Clinical Hematology, Rhode Island Hospital and former president of the Rhode Island Medical Society.)

* * *

Michael A. Ingall, MD:

Should a physician participate in an execution? For centuries, the executioner wore a black hood. Had his identity been known, he would have been shunned. It was a dirty job, but someone had to do it. Should we exchange our white coats for black hoods?

To me, it seems fairly straightforward and simple: a physician who participates in an execution is doing something unethical, immoral, and wrong. A physician's task is to alleviate suffering; to bring comfort; to heal, if not to cure. Executions, if they are sanctioned by the state, are carried out by executioners, not by physicians. To say that lethal injection is a more humane way of killing a human strikes me as absurd.

There are times when a physician acts to facilitate death. But euthanasia, as practiced with safeguards under the law in Holland or in Oregon is not the same as killing. A person has a terminal and painful disease that doctors certify will end in death. The person requests repeatedly to die a painless and dignified death, with the concurrence of those who love her/him. The person is found to be competent to make the decision to die. Under such circumstances, a physician may assist a patient, through medical intervention, to die. I use the word patient advisedly, for a doctor-patient relationship has been established. This is not an execution or killing. It is consistent with the physician's obligation to relieve suffering.

An accident or a medical catastrophe may render a patient helpless and uncon-

scious with no hope of recovery. The person has left a living will and/or a power of attorney, with instructions that s/he does not wish to live in such a condition. A physician may, with the concurrence of those who love the patient, withhold or discontinue extraordinary life support measures, such as ventilators, intravenous fluids, antibiotics, or nasogastric feedings. This is not killing. This is the alleviation of suffering, part of a physician's role.

Of course, a physician must treat prisoners on death row, awaiting execution. But suppose a prisoner awaiting execution goes on a hunger strike, refusing to eat. Suppose the prisoner is found competent to make such a decision—should the physician insert a feeding tube or administer intravenous fluids against the prisoner's will, so as to keep the patient alive until his execution date? What if a judge orders a feeding tube inserted, but the physician considers the prisoner competent? Do we remove from the prisoner all elements of autonomy? Is s/he less than human?

Things can become even more complicated for the psychiatrist who is asked to treat a prisoner on death row who has developed a psychosis and is delusional and hallucinating. Legally, a person must be competent and aware in order to be executed. Shall the psychiatrist undertake the treatment of an obviously ill person with a view towards restoring his mental health and competency just so he may be executed? No? But the man is mentally ill, not malingering. Does he not deserve treatment?

So, things are not so simple and straightforward after all.

Should the death penalty be reestablished in Rhode Island? The word "sacred" intrudes on my consciousness. Life is "sacred." We physicians have a "sacred trust," a "sacred obligation." In fact, we have no monopoly on decisions about life and death. We think we are more familiar with death than most, but homicide detectives and soldiers are even more familiar with death.

Nevertheless, we doctors are a potent political force, and we can exert moral leadership, if we choose to. And this is a moral, not a medical question.

Capital punishment should remain abolished in Rhode Island. Not just because John Gordon may not be the only falsely accused man we execute. Not just because we kill far more minorities and poor people than their representation in the population. Not just because the legal system is not always just and fair. We should oppose executions because it is wrong to kill a human being when we have alternatives. A dangerous person can and should be locked up for as long as s/he is dangerous. A life sentence without possibility of parole already exists in Rhode Island.

And what of revenge? Does not the Bible offer us the *lex talionis*, "an eye for an eye, a tooth for a tooth?" The same Bible begins, however, with Cain slaying his brother Abel. He is cursed and punished by God, banished to wander the world, but he is not executed. Abraham is on the verge of sacrificing his beloved son, but an angel intervenes, crying out against human sacrifice. The Bible offers many remedies and institutions that are no longer acceptable today. No one today calls for the death penalty for the adulterous woman (the man's punishment was generally less severe), nor for the stoning of the rebellious son at the city gates. No one calls for the reestablishment of slavery under the laws codified in the Bible. In fact, the rabbis of the Talmud modified the dictum, "an eye for an eye," to mean "the value of an eye for an eye."

In spite of the despair that sometimes makes us feel that a latter day Gibbon will soon document the decline and fall of our civilization, it is important to keep in mind that we have taken some steps forward in the continuum of moral development since Biblical days. We have begun to question the wisdom of brandishing weapons of mass destruction as a means of maintaining political and economic dominance. Our treatment of children and the poor, bad as it may be, is infinitely better than it was two centuries ago. Slavery has been abolished in Rhode Island. The death penalty has been abolished in Rhode Island. Let's leave it dead and buried.

(Dr Ingall is in the private practice of psychiatry in Rhode Island and is clinical associate professor of psychiatry and human behavior at Brown University School of Medicine.)

* * *

Frank M. Kahr, MD:

The power of the state is awesome. Prosecutors in particular are able to select and manipulate evidence, and to affect public opinion through their statements to the press. They are under pressure to be tough on crime. As a result, prosecutorial power has been misused at times. If we reestablish the death penalty, some innocent people will be executed.

We need not dwell on the highly publicized case in Dallas some years ago in which a man was convicted of killing a police officer, sentenced to death, and prosecutorial misconduct was later uncovered. Closer to home, at the first Von Bulow trial, forensic evidence was presented which was believed at the time to be definitive. At the second trial, serious doubts were raised about the validity of this evidence. Claus Von Bulow is a wealthy man who could afford the best possible defense. Most criminal defendants are poor and inarticulate and do not have access to first rate defense counsel.

Advocates of capital punishment are usually aware of these problems. They do not usually advocate routine use of the death penalty, but rather say that it should be reserved for the most horrible crimes. It is precisely in the most horrifying cases, however, that the possibility of error is the greatest. The public is clamoring for a perpetrator, and the prosecutor knows that he may be voted out of office if he does not provide one. Why eliminate the possibility of reconsideration and risk a fatal error?

We do not trust the benevolence of government in other areas of public life, and we should not trust it in this area. Rhode Island has been without the death penalty for 140 years and has remained a civilized place. Our state is less violent than many areas of the country. It is not likely that increased violence by the state will result in decreased violence by individuals.

Regarding physician participation in executions, the AMA stand such participation is a violation of medical ethics is sound. In addition to the general arguments against capital punishment, we must consider that our role as physicians is to heal wherever possible, and certainly not to assist others in imposing the death penalty.

(Dr Kahr is in the private practice of medicine in Rhode Island.)

* * *

William Braden, MD:

On reading the AMA policy, my first reaction is not so much that physician participation in an execution is unethical; rather, it seems stupid and unnecessary. I suppose avoiding stupidity has an ethical dimension, but I suspect this is not what the AMA had in mind.

I should say first of all that I do not think the death itself to be unethical. I believe that the state has the right, indeed sometimes the duty, to kill those who, individually or as a class, threaten the safety or survival of its citizens by their criminal behavior. At the same time, I think that a humane and relatively wealthy republic such as ours can afford to lock up ordinary murderers for life, so I would not propose a major expansion of the death penalty, either in Rhode Island or nationally. It seems most appropriate for those who might figure the risks and benefits of heinous crimes in a sort of "economic" cold-blooded way. An example would be threats to kill in order to extort money, as in kidnapping, or to extort political concessions, as in certain terrorist actions. The current death penalty provision for someone who murders while serving a life sentence follows this logic; absent the death penalty. there is no risk attached to the new crime. I would go a bit further and suggest execution for anyone who murders on more than one occasion.

For someone who opposes the death penalty, it's easy to say a doctor shouldn't help carry it out: it would be equally unethical for anyone to assist, regardless of professional status. But I have just argued that the death penalty is ethically acceptable. Moreover, I believe that our state is a government of the people, and that it is putting the criminal to death on behalf of me, my family, and my neighbors. Execution should then be viewed as a responsibility shared by all the people. Whether one assists with the practical aspects of the execution is morally irrelevant (however personally distasteful): anyone who has agreed with the legislature's enactment of the death penalty has a hand on the switch, as it were. The status of physicianhood does not exempt one from this collective responsibility.

On the other hand, some states are saying that physicians should participate precisely because they are physicians. It is this position I reject as stupid and unnecessary. Yes, physicians have some specialized knowledge that could be useful. But a non-physician executioner can quite adequately follow a protocol for inducing death, and for determining when it has occurred. I don't especially like the image of the doctor assisting at the execution. Since other members of the public may feel the same way the profession's public relations would probably benefit if doctors did not so assist. I cannot, however, invoke my own tastes or public relations advice in an ethical debate. So, for practical reasons, I would certainly oppose any state law requiring physician participation. But if I heard that an individual physician assisted at an execution, whether by requirement of law or not. I would have no basis for declaring his or her actions unethical.

(Dr Braden is in the private practice of psychiatry in Providence and is clinical assistant professor of psychiatry and human behavior at Brown University School of Medicine.)

* * *

Melvin Hershkowitz, MD:

Thirty-eight states now have the death penalty. Rhode Island is not one of them. Death penalty proposals for 1995 have failed in the Rhode Island legislature, but may be re-considered next year and in years thereafter, reflecting controversy that divides our legislators in a manner similar to abortion.

Most United States citizens favor the death penalty, but legislators have been slow to enact it. In states where it is in effect, only 6% of such sentences have been carried out (300 executions of 5000 sentenced) since 1972. Why is there no unanimity about the death penalty, what are the sources of doubt and conflict, and what should physicians do about it?

An Eye For An Eye Versus Thou Shalt Not Kill: The admonition of *Primum Non Nocere* for physicians may be equated with Thou Shalt Not Kill, but An Eye For An Eye says otherwise, and demands the death penalty for murder. Accidental deaths caused by drunk drivers produce great pain and anguish for families and friends of victims, yet drunk drivers who kill are often punished with mild sentences, since there has been no evident premeditation or intent. Should intent matter, or only the finality of the crime? The act of driving a car when drunk is a form of irresponsibility, with "intent" to transgress restraints which protect society at large. Given this form of "intent," killing by drunk drivers could be punishable by life imprisonment or the death penalty in some circumstances. Disparities in punishment are inexplicable to many people, particularly those whose young children have been killed by a drunken driver.

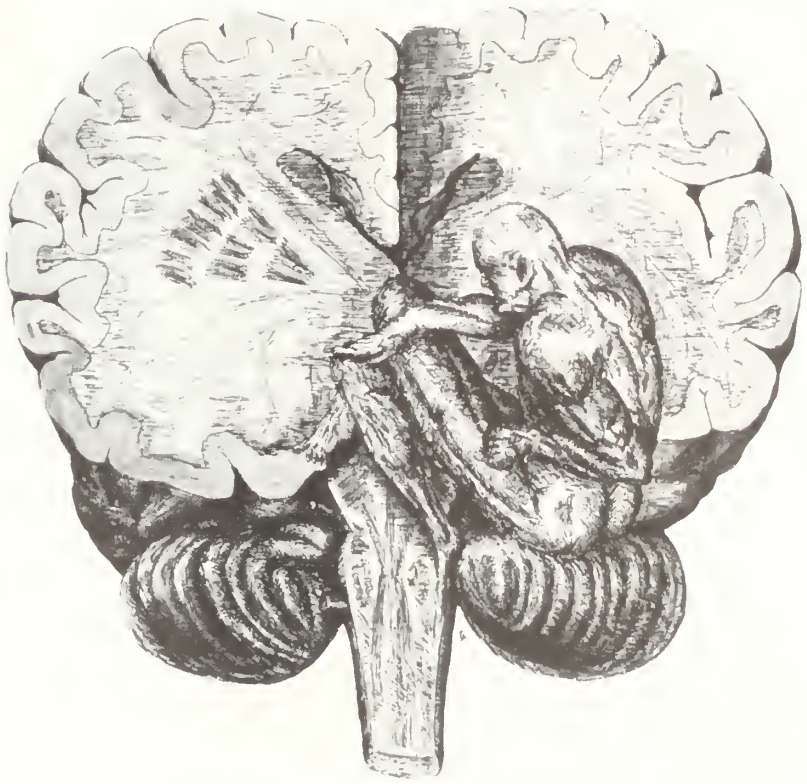
The Physician as Executioner: This is moot for Rhode Island at present but could become controversial in other states which use death by lethal injection as a method of execution. Doctors do not perform electrocutions, and the proposal that we give lethal injections is anathema to most of us. I share that view. Trained technicians can administer intravenous drugs. Doctors may reasonably be asked to confirm and pronounce death at executions, an exercise of professional judgment. Caring for dying patients is not the same as observing deaths at executions. Prisoners are not our patients. There is a non-relationship until the post-mortem moment. Nevertheless, post-mortem pronouncements are within the definition of ethical behavior for doctors, despite lack of prior professional contact with the deceased. The AMA Council on Ethical and Judicialo Affairs disagrees with this view, stating that if thhe prisoner does not die, the physician might be forced to recommend a repeated execution procedure, and that this would be a breach of ethical standards. The American College of Physicians, the American Nurses Association, and the American Public Health Association have asked state licensure boards to consider a physician's participation in executions as unethical and grounds for discipline, including the possibility of license revocation.

Personal Versus Global Aspects Of The Death Penalty: If someone murders a member of my family, do I want the death penalty for the murderer? Yes. Can I extend this desire to society at large? Maybe. Can I forgive on a more remote scale,when I cannot in a specific case? Shall we have a death penalty for crimes committed against our families, but not for crimes more distant from us?

Religious Aspects of the Death Penalty and Random Multiple Killings by Criminals: All major faiths have some doctrine opposing the death penalty, yet individuals within all faiths favor it. The Pope's recent statement on public affairs and morality criticized the death penalty, but he made an apparent exception for circumstances when society cannot defend itself. Society can not defend itself against inexplicable multiple random killings, which have proliferated in recent years. Innocent persons have been murdered in schools, cafeterias, and other public places. In New York, people were recently murdered at random while commuting on a railroad train. These situations fit the Pope's definition of circumstances under which society cannot defend itself, and the criminal would be subject to the death penalty. As long as the National Rifle Association believes that unlimited access to assault weapons and handguns is needed in a modern society, this risk will continue to exist. The best defense against it is total denial of such access to deadly weapons. This is unlikely to occur, since Congress appears to believe that we are still a frontier society. What then can be done to criminals, psychotic or sane, who randomly take multiple innocent lives, creating levels of loss, grief and mourning that can scarcely be measured? Even the death penalty hardly equals the enormity of such crimes. Various "compassionate" standards of judgment in such cases turn away from the death penalty, citing abnormal psychiatric states, no true intent, deprivations in background and education, and several other reasons as mitigating factors. In jest, but seriously too, we may ask: is anyone perfectly sane at the exact moment of murder? We can often answer yes, since psychiatrists themselves differentiate psychoses (insane) from psychopathies (sane) and sociopathies (sane) and behavior disorders (sane).

Psychiatric Incapacity as a Mitigating Factor: Should It Matter? Here are two answers: a) Yes, since the psychotic criminal has no insight or knowledge of wrongdoing, and is thus not "responsible" for the crime; b) No, only the finality of the crime, not factors in its genesis, should determine the punishment. Awareness and intent should not matter. The harsh opinion in answer (b) is partly based on frequent abuse of the "temporary insanity" defense. Where florid psychotic disease is apparent, the insanity defense may seem credible. When the borderlines of personality and characterological disorders produce psychopathic and sociopathic crimes by people uncaring about the consequences, despite insight and recognition of transgression, the insanity

defense becomes untenable. Should they be permitted to hide behind a "temporary insanity" defense, or should they be eligible for the death penalty, since many are not amenable to therapy or rehabilitation? Recidivist crime by this group abounds in our society. As harsh as it may sound, imposition of the death penalty would diminish murders and other crimes committed by "cured" and "not dangerous" sociopaths and psychopaths.



Invalidity of Deterrence as an Issue: Sociologists and criminologists who oppose the death penalty say that it fails as a deterrent. Many lawyers and judges agree. The incidence of crime in death penalty states may not be lowered, and may sometimes increase. The importance given deterrence as a major argument against the death penalty has always puzzled me. The act of execution is a total deterrent against individual criminals. They will never commit another crime. The deterrent effect of the death penalty is thus much greater than generally reported, since these numerous potential future crimes are not included in customary statistics. Life imprisonment without parole is said to equal the death penalty as a less cruel deterrent. It is not. Convicted prisoners may and do commit additional crimes while in jail, may arrange and advise on criminal acts by friends outside of jail, and some may even escape from jail to commit more crimes themselves.

Life Imprisonment Without Parole: Pleasures of Daily Life in Jail: Are there pleasures in jail? Is this query a joke? It is not. Jailed criminals can enjoy some or all of the following in varying degrees: tasting and savoring food; the joys of sex in a limited manner; rest and sleep; social intercourse with friends and visitors; and reading, watching television, listening to music, and physical exercise. The public often expresses anger at the availability of such gratifications for jailed criminals. Do they deserve them? Many people think not, though this view may seem vindictive and excessive. No one proposes to starve criminals or to deprive them of social contacts.

Differential Imposition of Death Penalty by Occupation of Victim: In some states the death penalty is imposed only for murder of law enforcement personnel. I consider this an abomination and a diminution of the value of the lives of all citizens.Why should a police officer's life be held more precious than my own or of any adult or child? Police are well-compensated, beyond salary, for their risks, especially with lucrative retirement benefits and special perquisites. They enter their occupation willingly, aware of the risks.

Enormity of Crime Versus Enormity of Punishment: This dilemma is epitomized by the Holocaust, the crime of ultimate enormity with relative lack of punishment of the German nation. The prosecution of a few prominent German leaders spared the German citizenry from meaningful punishment. Could civilized nations inflict upon Germany a punishment equal to the Holocaust? The question seems ridiculous, and historic events have proved it so. The hideous cruelties suffered by Holocaust victims were never in turn inflicted upon the German populace. This restraint may not prevail in the future, however. Ethnic cleansing massacres occur in Bosnia; inter-tribal massacres in Rwanda and Burundi; and Iranian massacres of B'Hai are reported, plus numerous genocidal acts thoroughout the world.

The Death Penalty Discriminates Against the Poor and Minorities: This is hard to prove. In some population centers, "minorities" are now the majority. If crimes are committed in high frequency by the poor and minorities, who shall be punished for them? The innocent rich? The innocent majority? There are, certainly, gross inequities in access to skilled legal representation. The structure of the legal system itself is at fault (no Medicaid system for legal services), and the fees of lawyers conspire against poor minorities. However, this is the cart before the horse. What "made them do it" came long before the need for a lawyer. What, indeed, "made them do it"? We know the list: poverty, drug abuse, dysfunctional and single parent families, no healthy role models, teenage unmarried mothers with no social or occupational skills, and hopelessness. Yet the majority of the poor do not commit major crimes.

Diabolical Crimes Committed by Children, and the Death Penalty for Children: These are chilling issues. Young children and juveniles have committed some of the cruelest forms of torture and murder, often choosing much younger children as victims. There is no death penalty for such crimes. We all hope that child-juvenile criminals can be rehabilitated, yet many are already sociopathic and will benefit little or not at all from treatment or compassionate re-education. Should it matter that the offender had a deprived background or was disturbed psychologically? Do evil children and juveniles deserve compassion and rehabilitation efforts by the state? Juveniles, in restricted circumstances, can be tried as adults and thus become eligible for more punitive sentences. When tried and convicted, these criminals escape the death penalty, but the general consensus, including this author, would favor it.

Wrongful Conviction And Wrongful Execution: This is the single most disturbing moral dilemma for proponents of the death penalty. No one wants to execute an innocent person. Can this ever be entirely prevented? Probably not. Supporters of the death penalty therefore must make strenuous efforts to minimize this risk. All procedural safeguards must be strengthened, including an automatic appeal privilege and provision of skilled legal representation.

Where evidence of crime is incontrovertible, not wholly circumstantial, not by isolated confession alone, and supported by one or more eyewitnesses with forensic confirmation, the death penalty will rarely be imposed on an innocent person.

Exaggerated Costs of Execution: Costs of executing criminals are said to exceed costs of life imprisonment without parole. This may occur when endless appeals are permitted by prisoners under death sentences. This privilege is sometimes cynically abused by prisoners trying to delay execution. We can understand their desperation, but sharp curtailments of such appeals are now proposed in some states and federal jurisdictions. If put in place, these restraints will sharply reduce administrative and procedural costs of executions. In addition, as the natural longevity of prisoners increases, the ultimate lifetime costs of their incarceration will rise, and will exceed the costs of execution.

Compassion Versus Vengeance: What is wrong with vengeance? Are lawful citizens dehumanized by it, and must it always be accompanied by guilt? Vengeance may represent the triumph of rectitude over evil, and can be a mature antidote to despair and impotent resignation. Vengeance is understood and accepted by many as simple retaliatory justice. The less popular view, to which I subscribe, is that in some circumstances vengeance and retribution are valid as stabilizing instruments to preserve lawful and civilized society. It is interesting that our most popular male film stars often play the roles of lawful avenger, assuring the triumph of good over evil, sometimes in scenes of considerable violence inflicted upon criminals. Cheers of righteous catharsis fill the air as they ensure the safety of lawful society. Even my 5-year-old grandson senses this as he dons his Superman cape and goes forth to "get the Bad Guys." The sociologic significance of these symbolic fighters cannot be summarily dismissed as mere childhood fantasy and unhealthy aimless violence. Quite the contrary. The violence is specific, the targets unlawful and evil, and triumph is welcome. To deny this is to avoid reality and to avoid the painful conclusion that the death penalty is frequently carried out by our heroic guardians with our complete approval.

Summary: I have discussed some controversial issues related to the death penalty. I oppose physicians acting as executioner in states where the death penalty is operative. I favor the death penalty in certain circumstances, but I also appreciate the torment and doubt of those who oppose it.

(Dr Hershkowitz is a retired internist living in Providence and a member of the clinical faculty at Brown University. Formerly, he was clinical associate professor of medicine at the George Washington University School of Medicine.)

* * *

Herbert Rakatansky, MD:

Capital punishment is a subject sure to stimulate discussion if not argument. Physicians must examine two basic questions.

First, we must consider whether as individuals, or as a profession, we approve of capital punishment. Second, we must consider whether physicians should participate in capital punishment.

The first question is difficult for the individual but easy for the profession collectively. I believe that since capital punishment does not relate to the practice of medicine, the medical profession as a whole should not take any position for or against it. The individual physician may, as any person, make a determination about capital punishment. The reasons for support or opposition are myriad and often the same evidence is used to support each side of the dispute. For example, the issue of whether capital punishment is a deterrent is cited by those favoring as well as those opposing capital punishment. One could be ambivalent as well and avoid a commitment to either viewpoint.

These opinions do not influence the answer to the second question concerning physician participation. This issue is difficult for both the individual and the profession.

I agree with the position of the AMA[1] that physicians should not use their professional skills to participate in capital punishment. This position derives from the ancient and universally accepted ethical principle that physicians "should do no harm." Certainly killing someone is harmful.

One could argue that participating in capital punishment is similar to withholding or withdrawing life-sustaining treatment. There are fundamental differences, however. After the withdrawal or withholding of treatment the consequences and outcome are the result of the underlying terminal illness for which there is no further acceptable treatment. Capital punishment is administered to persons with an otherwise significant life expectancy. Also, the withholding or withdrawing of life-sustaining treatment is done with the consent of the patient (or surrogate) with the knowledge that death (as a result of a terminal illness) is the likely outcome. The condemned prisoner cannot be presumed under any circumstances to have chosen death.

Part of the therapeutic efficacy of the medical profession is the trust that society has in the basic, helpful nature of the doctor-patient relationship. This results partly from the trust that society has in the profession itself and the belief that doctors always will be advocates for their patient's welfare. Physician participation in capital punishment can only erode and destroy that trust. Our patients need to know that we are advocates for them at all times and that the government cannot reverse that commitment. We must not forget physician participation in actions contrary to patient's welfare in Nazi Germany and Russia. The medical profession must stand firm and support the ethical principle that has served physician and patient well since the time of Hippocrates: "First, do no harm."

As is so often said, "the devil is in the details." It may seem simple to agree that physicians should not participate in capital punishment. The problem arises in trying to define exactly what constitutes participation. It is obvious that physicians should not actually perform the execution. We should not insert the IV for a lethal injection; we should not prescribe the lethal drugs; we should not advise which drugs to use; we should not mix the drugs; we should not

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Should a physician pronounce the prisoner dead? What if the execution fails? The physician then tells the executioner that the prisoner is not dead. The executioner tries again. By telling the executioner that the prisoner is still alive the physician is participating in the execution. He is using his medical skills to harm a person. The physician, therefore, should not determine death during the course of an execution. Certification of death at a later time is acceptable if it is not part of the process of execution.

What about testifying about a prisoner's competence to stand trial for a capital offense? Under this circumstance the testifying physician is offering only an opinion, not making the decision. The judge makes the decision and the physician's opinion is not the sole factor in the decision. The accused is protected by due process and varying opinions might be proffered. Also it is possible that the decision would protect the accused from capital punishment. The legal definition of competence often will differ from the medical definition. It therefore seems appropriate for physicians to offer this type of testimony.

The law states that an incompetent prisoner cannot be executed. Is it appropriate for a physician to assess the competence of a condemned prisoner to be executed? There is no easy answer to this. It has been suggested that physicians should participate only when due process is observed and there is a non-medical decision-maker such as a judge who will make the final determination.

Should a physician undertake to treat a condemned prisoner awaiting death? It seems reasonable and appropriate for a physician to use his medical skills to relieve pain and suffering as long as such treatment does not hasten or enable the execution. The physician may provide medication, counseling and even surgery to the condemned prisoner as he would provide such to any other person. This treatment will alleviate pain and suffering, both mental and physical, and may actually prolong life. It must be done, however, only with the informed consent of the prisoner.

There is one thorny exception to this rule. What about the condemned prisoner who has become psychotic, is suffering greatly, and may be a danger to himself through self-inflicted bodily harm?[2] Since the state will not execute a prisoner who is incompetent and unable to understand the process, should a physician treat the psychosis and thus, by restoring the prisoner to competency enable the execution? The prisoner obviously is unable to grant informed consent under those circumstances, and it is hardly likely that the state, as guardian, would be acting in the patient's best interests in granting consent. In at least one state (Maryland) the problem has been solved by commuting the sentence to life imprisonment without possibility of parole in this circumstance. With such a commutation the physician could offer all appropriate treatment without fearing that it would lead to execution. It certainly behooves the physician to request such a commutation before treating the psychotic condemned prisoner. In the absence of such a commutation there is no adequate answer to the posed dilemma. The physician must rely on his professional judgment.

Another dilemma concerns organ donation. Should physicians participate in organ retrieval from the bodies of executed criminals? AMA guidelines permit this in only limited circumstances. The consent for donation must have been made by the donor prior to the conviction. The method of execution must not have been altered to enable more efficient harvesting. The harvesting must take place outside of the site of execution. Thus the donation must be independent of the execution. Physicians should not partake in harvesting or using organs obtained from condemned prisoners unless these guidelines have been observed. It would be easy to start sliding down a "slippery slope" in this area.

As professionals, doctors must use their medical knowledge and training solely to advocate for their patient's welfare. Participation in capital punishment is a violation of that most basic principle.

1. Physician Participation in Capital Punishment. American Medical Association. Report 46 of the Council on Ethical and Judicial Affairs; Jan. 1993.

2. Heilbrun K, Radelet ML, Dvoskin J. The debate on treating individuals incompetent for execution. *Am J Psychiatry.* 1992;149:596-605.

(Dr Rakatansky is an internist in private practice as well as clinical professor of medicine at Brown University School of Medicine. He currently serves as a member of the AMA Council on Ethical and Judicial Affairs and is a former president of the Rhode Island Medical Society.)

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Rev Paul Conner, OP, STD, Rev Janet Cooper Nelson, MDiv, Edward Beiser, PhD, JD

Easing the process of dying has always been a fundamental mission of medicine. When faced with the inevitable, the successful fulfillment of this mission neither hastens death nor prolongs the irreversible process of dying. In the last few decades, however, two profound and unrelated changes have arisen that bring this issue to the forefront of societal concern: First, newer technologies can now prolong life measurably, perhaps beyond the point of tolerable existence; and second, the educational attainments and assertiveness of patients (and their families) lead them to demand a more significant voice in the choice—or non-choice of medical interventions. No longer is the physician compelled to be the isolated observer as the disease pursues its remorseless course; and no longer will the patient tolerate being excluded from the decision-making process. Increasingly, families are insisting upon a share in the moral burden of deciding when to cease measures, sometimes called heroic, or even measures, called elementary, needed to sustain life.

On two consecutive Tuesday evenings in May 1995, open forums were held on the campus of Brown University exploring this subject. The speakers included Dan Brock, PhD, professor of philosophy at Brown; Ed Beiser, JD, PhD, associate dean of medicine at Brown; Rev. Paul Conner, OP, STD, professor of moral theology at Providence College; Ed Forman, MD, professor of pediatrics at Brown; Ed Martin, MD, medical director, Hospice Care of Rhode Island; Rev. Janet Cooper Nelson, chaplain at Brown; and Rev. David Shire, minister emeritus, Newman Congregational Church, Rumford. The meetings were moderated by Stanley M. Aronson, MD, MPH, dean of medicine emeritus at Brown.

The discussions were earnest and often intense. Many questions were raised, some directly related to physician-assisted suicide and some only marginally so. These questions included: Does an acceptance of physician-assisted suicide in some way threaten the historic element of trust between patient and physician? Does a general hospital have the right to explore the personal belongings of an incoming patient for substances that might be used for purposes of suicide? An 11–year–old boy is struck by a passing car and sustains multiple injuries including a ruptured spleen. The parents, members of a religious sect, refuse to allow blood transfusions declared by physicians to be life-saving. Does society have the right to ignore their wishes? An 8–year–old child develops a form of bone cancer which, according to current data, is curable in about 60% of patients undergoing intensive therapy. The parents, on religious grounds, refuse such intervention, relying upon faith-healing. Does society have the right to intervene? If the cure rate were said to be 2%, would society still have this right? Are there any circumstances that justify suicide by a cognitively intact, terminally ill person? Are there any circumstances outside of the terminally ill scenario that justify suicide? If a healthy individual goes on a hunger strike, impelled by moral beliefs, does society have the right to force-feed? Can suicide be condoned if the act directly saves the lives of others? Is the withholding of medication, or even nutrition, contrary to the wording and spirit of the Hippocratic Oath?

Summaries of many of the formal presentations are provided below.

Physician-assisted Suicide: A Hospice Response

Edward M. Martin, MD

Last year, Oregon voters approved a measure allowing physicians to prescribe a lethal dose of medication to assist terminally ill patients in committing suicide. While prohibiting euthanasia and lethal injection, the measure attempts to make it easier for terminally ill patients who wish to commit suicide to obtain lethal medication. The desire for physician-assisted suicide may have its roots in compassion for the terminally ill, but this kind of public policy will worsen an already bad situation for those faced with a terminal illness.

The Oregon measure, like other similar proposals, assumes that terminally ill patients have legitimate, rational reasons to commit suicide unlike other individuals for whom suicidal ideation is considered a sign of psychiatric illness. One might assume that suicide is common among cancer patients and that this effort simply seeks to make the process more humane. In fact there is no conclusive evidence that the suicide rate of cancer patients is higher than the general population. This is not because they are too weak, as functional limitations did not appear to be an important variable. Important risk factors for suicide in cancer patients included prior suicide attempts and an exhaustion of resources.

The proposal also contains provisions that supporters hope would provide safeguards so that only patients in the final months of life who have made a rational, thoughtful decision to commit suicide will be eligible for physician assistance. Patients must be determined to have a prognosis of 6 months or less. The 6-month yardstick was the figure that federal health policy makers used to limit the fiscal responsibility for Medicare in covering hospice care. Predicting prognoses is a very inexact science. It is not uncommon for patients to be admitted to hospice with a specified 6 months prognosis only to recover and be discharged from hospice care. Patients who chose the suicide option after being given the 6-month prognostic decree would have no second chance.

The focus of physician-assisted suicide proposals is on prognosis and not the burden of suffering. Many of the publicized cases of physician-assisted suicide, however, have not been in the final 6 months of life. Progressive neurologic disease such as Alzheimer's disease, amyotrophic lateral sclerosis, Huntington' disease, and Parkinson's disease result in a progressive loss of function, physical and/or cognitive. This may be perceived as an intolerable burden of suffering by the patient. These patients are much less likely to have access to comprehensive palliative care such as hospice, and these efforts do nothing to improve the plight of this population of patients. Many physician-assisted suicide proposals mandate a second opinion. This, supporters hope, would insure that the patient has been adequately treated with respect to pain and other symptoms. However, a system that cannot now insure good symptom control of most patients cannot be expected to insure adequate symptom control of those who come forward seeking suicide. The second opinion safeguard is also supposed to exclude patients who might be depressed from exercising the suicide option; however, the failure of physicians to diagnose depression especially in the terminally ill is well documented in the medical literature.

The call for physician-assisted suicide is understandable. Pain and suffering are poorly controlled in terminally ill patients. This is not due to a lack of effective treatment for

these symptoms, but rather due to the fact that relief of suffering is not a priority in patient care, and it consistently fails to be addressed in a systematic and comprehensive manner. To focus on the few patients who request physician-assisted suicide as an answer to that suffering is tantamount to throwing out the baby and saving the bath water. I cannot imagine a system of legalized physician-assisted suicide that would not lead to further deterioration in the level of quality we expect in palliative care.

Hospice has been proposed as an alternative to physician-assisted suicide. Hospice, an interdisciplinary program consisting of palliative care, psychological, emotional and spiritual support, does assist patients with their death but does not assist with hastening death. The focus of hospice is very different than the focus of the physician-assisted suicide debate. The focus is on living and improving the quality of life of the terminally ill for whatever time they have remaining, be it a month, a week or a day. Many patients express thoughts of suicide following admission to hospice, asking to end it all. Many of these individuals have not had their symptoms adequately controlled. With good symptom control we see the change of focus from ending it all to preserving the quality of whatever time they have remaining. Other patients find relief of their fear and anxiety regarding dying can be gained from the support provided by the nurses, social workers, chaplains, volunteers and other hospice professionals experienced in these issues who come into the patient's life at this difficult time. Again, the focus frequently shifts to living and away from dying. To many who work in hospice the tragedy of those patients who commit suicide is a lost opportunity. It is not unusual to hear patients and families talk about the final days of life as some of the "best days of my life," this in spite of the profound tragedy of the situation. For many patients it represents an opportunity to forgive, be forgiven, say "thank you," "I love you," and "good-bye."

It is argued that the suicide option must be available because we cannot control the physical sources of suffering of all dying patients. This is simply unacceptable. All patients should be able to have their symptoms controlled but this is not always easily done. Comprehensive palliative care is a 7–day–a–week and 24–hour–a–day effort by a team of health care professionals. It will always be more costly and more time-consuming than the suicide option.

Most patients have symptoms controlled by oral medications, however, some require infusions and in some cases sedation is required to achieve comfort. Sedation is not simply a more passive form of euthanasia. The intent is clearly the relief of suffering, not to hasten death. Symptom control remains the focus and patients are continually evaluated and medications adjusted to provide only as much sedation as is necessary to relieve symptoms. In physician-assisted suicide the focus is termination of life.

Whether or not physician-assisted suicide is legal some patients will continue to choose suicide as a means of ending their lives. Some will choose to hasten their deaths in a very private and personal way by refusing further nutrition and hydration. Others may take an overdose of medications that almost all terminally ill patients have in their homes. Some of these patients will have a progressive illness with an uncertain future while others will have a terminal illness. These decisions will be made privately and will not necessarily be condoned by society. The focus of physicians is and must remain on living, for whatever time remains. To change that focus could jeopardize the care of countless other patients.

Society must not get sidetracked in its efforts to relieve the suffering of the terminally ill. We must demand the control of pain and suffering and improve access and availability of palliative care in hospice services. For the terminally ill the greatest tragedy is often not death but needless suffering. Our standards and expectations for the care of the dying must be higher. A physician who does not recognize or adequately treat suffering must be viewed as harshly as a physician who misreads pap smears.

The legalization of physician-assisted suicide would radically change our current health care system to provide a handful of patients with increased access to lethal drugs. It would shift the focus from living until death to the precise timing and manner of death. This change in focus, while seeking to ease the burden of suffering of terminally ill patients, would jeopardize the chances for all terminally ill patients to have access to high quality comprehensive palliative care.

(Dr Martin is medical director of Hospice Care of Rhode Island and clinical assistant professor of medicine, Brown University School of Medicine, and is in private practice.)

Physician-Assisted Suicide: A Pastoral Perspective

Rev. David Shire, MDiv

There is much I've learned in preparing this article, including the necessary limits one must place on such an emotionally charged and multi-faceted discussion. I've also learned that my perspectives about physician-assisted suicide are inextricably framed by a theological and biblical background, and 35 years of parish ministry. Let me offer some definitions as we begin.

"Physician-Assisted Suicide is not synonymous with either withholding treatment or euthanasia. Withholding treatment allows a patient to die. Passive euthanasia hastens death. In Physician-Assisted Suicide the doctor neither allows, hastens nor directly causes the death of a patient, but provides the means for a person to end his or her own life."[1]

"Assisted suicide occurs when a physician provides a patient with the medical means and/or medical knowledge to commit suicide . . . whereas in euthanasia the physician administers the death-causing drugs or other agent."[2]

The Council on Ethics and Judicial Affairs of the American Medical Association goes on to say that physician-assisted suicide and euthanasia differ from palliative treatment, the goal of which is to "relieve pain and suffering, not to end the patient's life, but the patient's death is a possible side effect of the palliative treatment." Suffering is defined as "the state of severe distress associated with events that threaten the intactness of the person . . ."[3]

Theological and Biblical Considerations: My discussion of physician-assisted suicide must include the issue of suffering from the historic aftermath of Jesus' suffering. In some Christian traditions the imitation of Christ has glorified suffering as part of God's plan for Jesus and as a redemptive act for the world. To a group of physicians on May 24, 1957, Pope Plus XII stated that "suffering helps toward the expiation of personal sin, and the gaining of richer merit . . . "[4] This belief supports the glorification of human suffering as a way of drawing closer to God, which may be true for a small number of special persons throughout history, but not for most human beings no matter how devout. God did not create human life for us to suffer, even though suffering is a byproduct of God's creative process. The belief expressed by Pope Plus XII, and held by many Christians, grew out of the conviction that God predestined Jesus for a suffering death "for our sins and in our place." I hold a different view of God, of Jesus and the purpose of Jesus' death. I do not believe in a God who requires human sacrifice to "save us," or individual suffering to earn merit or to cleanse us of our sin. Jesus' suffering and death were not a pre-ordained saving act, but the personal response of Jesus to God and to the political and social conflicts in which Jesus found himself and his teachings. God, who works in human history, used those circumstances, along with Jesus' decision to trust that good would result from his own inevitable death, to show us that life is eternal and love is immortal. It is not

Jesus' suffering that saves us. It is God's love, grace and mercy. Jesus' death on a cross was never intended to glorify suffering, any more than was the Holocaust or any type of torture. God abhors suffering and has given us the ability and capacity to relieve suffering. God anguishes over our injustice, our suffering and our failure to alleviate such destructive forces in our world. Therefore the appropriateness of our question: is physician-assisted suicide one way to do this?

Some Biblical Background: "God created humankind in His own image, in the image of God He created him; male and female He created them." (Genesis 1:27).

"Then the Lord God formed man of dust from the ground, and breathed into his nostrils the breath of life; and the man became a living being." (Genesis 2:7).

In any discussion of physician-assisted suicide, the question "what are we?" must be addressed. The two different Creation stories in Genesis, quoted above, are representative of the myths and stories that have helped shape our beliefs about who and what we are. In Genesis 1:27, we find the concept of "the image of God." The "image" is that spiritual capacity within humans that enables us to relate and connect to God. As the Psalmist said, God made us "a little lower than the angels and crowned us with glory and honor." (Psalm 8). This "image of God" also includes the capacity for thought and the power of self-transcendence within the human being. Therefore, it is interesting to note that contemporary paleoanthropologists have labeled us "homo sapiens sapiens:" the creature that knows that it knows.

In Genesis 2:7 God breathes life into us to make us living beings. God's own breath or, more accurately, God's Spirit gives us life. This belief helps shape the holiness and sanctity of life itself, and our life force in particular. We are not created to live indefinitely. But we are created to live with meaning and purpose. When those values are no longer possible due to a terminal illness, should physician-assisted suicide become an option? In terms of the Genesis stories: because life comes from the Spirit of God, we must ask that if we end this life by our own will, would it countermand the will of the "Giver" of that life?

God's Will: In pastoral work we find many people whose faith journeys lead them to conclude that God alone decides when one dies: "it's God's will." Such belief implies that God decides, on a personal basis, when each one of us will die. In that framework, to countermand God's will would be "playing God." However, there are others of us who believe that we die when our bodies wear out, when medical treatment no longer works, and repair and replacement of body parts is not appropriate, but not by some individualized act of God. If God decides, then medical treatment, including replacing worn body parts, works against God's will. The concept of God deciding pre-dates a higher and clearer understanding of God's will, pre-dates antibiotics, angioplasty and body part transplants. What God did decide in the process of Creation was to make us the creature that knows that it knows, and allow us to become co-creators with God. Therefore, we can overcome the diseases that plague us and live meaningfully well beyond the Biblical number of 3 score years and 10, with harvested and bionic body parts.

Death: In the Christian view, what happens at death is the re-integration of our physical bodies with the stuff of the universe. Since we are literally made out of "star stuff," we become star stuff when we die. Our life force, or soul, goes to God to live at a spiritual level in relationship with God. Therefore, if our survival is not dictated by God but is at the mercy of our biology and the limits of medical knowledge, it is not a choice between life and death but a choice of when and how we die. And, in terms of this discussion, do we have the right to end our own lives with the assistance of a physician? This leads us to raise the question of autonomy.

Autonomy: There is clear consensus today that patients have the right and responsibility to share with the physician in their own treatment decisions. We are also able to make medical decisions for future care through advanced directives before our decision-making capacity is diminished.

General Synod IX of the United Church of Christ, my denomination, issued a resolution on Advance Directives as early as 1973. It states that theology relates our tradition to "present and changing concerns" and "searches for the will of God known, and to be made known to us." We must continually balance the weight of tradition and traditional thought against new issues and new insights. Certainly high tech medicine and our ability to keep bodies alive with debilitating illnesses is a concern that falls within the spirit of this resolution. We need new thinking for new issues as we seek to bring to bear the will of God "known and to be made known to us." This necessitates not only our balancing "goods," but also our recognizing a conflict of "goods:" the right of an individual to choose his or her own destiny, the relief of long term suffering, religious and cultural standards opposing suicide, and safeguards designed to protect persons who are unable to make life-death choices for themselves. This argument for a person's right to choose, could be used to justify physician-assisted suicide.

I am indebted to the Rev Dr Brent Waters for his extensive discussion of these issues in his study guide referenced earlier: *Dying and Death, A Theological Response for Christian Reflection.*

Mercy: In addition to safeguarding our autonomy and balancing the right to choose as well as to protect, any analysis must include the concept of mercy. "Mercy" is part of the spiritual commitment we have to one another, to provide relief from pain and suffering for all persons within the parameters of self-sacrifice and the availability of resources equally distributed.

Justice: Where there is Justice, each person regardless of their illness, has a claim on whatever medical resources are available that might be effective. But if we continue to extend and expand the rationing of medical resources, will a concept of "distributive justice" result in treatment only for those who would benefit most? Could such a system ever be just, or would the ability to pay, a person's status in society, or even the luck of the draw, dominate decisions? And, would Justice mean that those who are dying be allowed to die, or left to die, with resources being "distributed" to those that are salvageable. Most significant of all, who would decide?

Potential for Abuse: Just as autonomy, mercy and justice must be part of any discussion of physician-assisted suicide, so, too, we must also evaluate the potential for abuse to determine if strict protocols could allow physician-assisted suicide to become a medical option. Such abuse could include:

- family members who urge release from illness and potential suffering, because of their own inability to face dying and death, or for personal financial gain;
- spending down resources, as presently required by Medicaid, could pressure patients to consider physician-assisted suicide;
- the high cost of care, could conflict with the desire to leave one's assets to loved ones or charity.[5]

The very chaos of our current non-system of health care cautions us. We also know that the highest costs occur in the last few months of life, and individuals may choose to avoid those costs through physician-assisted suicide.

The issue of power and abuse of power constantly surrounds the physician. Merely the suggestion that "nothing more can be done" may communicate the potential for suffering and pain, unless pain control and palliative care are well understood and utilized by the physician and communicated to the patient and to the family. The physician's personal ethics and morality, as well as words and manner, also shape choices by the patient.

Safeguards: Suggested safeguards against abuse of physician-assisted suicide

have included:

- the prohibition of fees;
- an extensive documentation of the patient's medical history, prognosis and reasons for the request;
- the counseling of patients toward a rational choice;
- psychological evaluation with testing for depression;
- a waiting period before a final decision is implemented;
- reporting to some external agency.[6]

Even though Dr Timothy Quill suggests that physician-assisted suicide should be carried out only in the context of a meaningful doctor/patient relationship, such safeguards appear impossible to guarantee and implement. The possibility of a close relationship between patient and physician grows dimmer in our present non-system of health care. Since many sick elders are depressed, would a request for physician-assisted suicide be a rational decision or a cry for help? Once again: who would decide? And, what about those physicians whose personal values would preclude physician-assisted suicide as a rational choice in any situation? The safeguards of documentation and reporting to an external agency would only be verifiable after the patient's death. Therefore such safeguards are fatally flawed. However, if secure medical and legislative safeguards could ever be established, those whose beliefs oppose physician-assisted suicide would never be compelled to choose it, while those of differing beliefs would have the freedom to choose.

Why Physician-assisted Suicide? What prompts the need for physician-assisted suicide? Fear of pain and suffering, loss of control and choice, diminishment of self-esteem, personal worth and dignity, stress on loved ones and the extraordinary cost of care during the final months of life are the issues that would prompt most persons to request physician-assisted suicide. Fear of abandonment is also a prime concern of persons diagnosed with a terminal illness. One of the first assurances we must offer a critically ill person is that we will be with there with multi-dimensional support, no matter what.

Choice: My religious tradition relies heavily upon free choice and informed decision-making. Given a safer world, with guidelines and protocols that would prevent abuse, one could argue that physician-assisted suicide could be an ethical and spiritually valid decision. But no guidelines are foolproof or tamper-proof, and death is final. The AHA report mentioned earlier, discusses the leading study of euthanasia in the Netherlands stating that "researchers found that, in about 28% of cases of euthanasia or physician-assisted suicide, the strict criteria were not fulfilled, suggesting that some patients' lives were ended prematurely or involuntarily."[2]

Pain Management and Hospice Care: Given the concerns that prompt the question of physician-assisted suicide, we must offer hopeful responses to the patient's fears. In addition to responding to the fear of suffering, abandonment, and the other concerns stated above, there must be competent pain control procedures along with that special kind of care for the terminally ill known as hospice care. In this imperfect world, these options provide an ethical, spiritual and hopeful alternative to physician-assisted suicide. All physicians should put into practice the *Clinical Practice Guidelines* presented in the *Management of Cancer Pain* by the US Department of Health and Human Services, the Public Health Service and the Agency for Health Care Policy and Research of March 1994, and advocated by the Rhode Island Cancer Pain Initiative:

- Clinicians should reassure patients and their families that most pain can be relieved safely and effectively.
- Clinicians should assess patients and, if pain is present, provide optimal relief throughout the course of illness.
- Curricula for health professionals should include sufficient content on pain to prepare clinicians to assess and manage pain effectively.
- Clinicians should include patient and family education about pain and its management in the treatment plan and encourage patients to be active participants in pain management.
- Federal, state and local laws and regulatory policies should not hamper the appropriate use of opioid analgesics for cancer pain.
- Clinician should collaborate with patients and families, taking costs of drugs and technologies into account in selecting pain management strategies.

The philosophy and practice of Hospice Care responds specifically to the concerns of pain and suffering that produce the question of physician-assisted suicide in the first place. Here in Rhode Island a growing percentage of Hospice Care of Rhode Island patients (30%) have been diagnosed with illnesses other than cancer. The hospice way of patient care provides more than pain control. Suffering is not only a response to pain, it is a response to a complexity of physical, social, spiritual and psychological factors. Through its multidisciplinary approach, hospice care reduces suffering. With pain and suffering under control, the patient's ability to be in charge and make decisions increases, as does self esteem, personal worth and human dignity. If the pain control initiatives and hospice care were fully understood and advocated by clergy, physicians and other health care providers, as well as by patients and their families, we would be closer to removing the need and desire for physician-assisted suicide or any type of suicide due to fear of pain and suffering, or loss of self esteem and human dignity.

As we continue to discuss physician-assisted suicide and explore protocols with safety guidelines, we must also work toward clarifying God's purpose, while allowing those who are non-theistic the right to view or choose physician-assisted suicide from their several perspectives.

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The Slippery Slope of Physician-assisted Suicide

Ralph P. Miech, MD, PhD

Recent articles in medical publications and in lay press have dealt with the topic of physician-assisted suicide as an acceptable form of euthanasia. In the vast majority of articles on euthanasia, the predominant danger to society in accepting the practice of physician-assisted suicide is generally referred to as "The Slippery Slope of Euthanasia." Yet no attempts have been made to illustrate what the slippery slope might entail. The following narrative attempts to describe in concrete steps the descent down "The Slippery Slope of Physician-assisted Suicide."

At present many physicians, along with a large percentage of the public, are in favor of taking the first step onto the "Slippery Slope", ie, legally permitting physician-

assisted suicide to be limited to requests from competent adults with a terminal illness and suffering with uncontrolled pain. As we slide down the "Slippery Slope" to the next level, legislation would be extended to allow patient-requested physician-assisted suicide by competent adults with a terminal illness without meeting the criteria of intractable pain. The next step would be legislative approval of physician-assisted suicide for competent adult patients requesting it not because of a terminal illness or intractable pain, but because of unbearable mental suffering. The door would open further for physician-assisted suicide to be legalized in state supported institutions, with the so called "proper safeguards," for comatose adults who are in a persistent vegetative state. Next on the eligibility list would be incompetent adults who have no hope of making a contribution to society and are utilizing scarce medical resources.

Economics has now entered the world of physician-assisted suicide and as our population ages, physician-assisted suicide, again with the so-called "proper safeguards," might be a necessity to free up beds in the nursing homes by being applied to patients who have no family. Once these "acceptable" economic and social criteria are legally applied to adults in the world of "physician-assisted suicide" the next two logical steps would be to apply eugenic arguments to include newborn infants with congenital defects.

Consumerism coupled to cost-effective medical practices would lead to competition for patients by hospitals with the establishment of enticing "Suicide Suites" within the hospitals. Then "Outpatient Suicide Clinics" would be advocated to cut hospitalization costs. Further cost cutting would be achieved by allowing patients to purchase "Suicide Kits" with the "proper safeguards," ie, available only with a physician's prescription.

To make physician-assisted suicide more attractive to a specific niche in the market place, private health care networks would employ "sound" business entrepreneurial practices and offer "Suicide Cruises" at a profitable fee for service. A new medical specialty will arise and might be known as "eschatology" and probably would be referred to in the vernacular as "Suicide Squads." As health care costs continue to rise, the government will look to further cost cutting initiatives. For example, to those patients without health care insurance and in need of extensive health care, the government may offer "Suicide Incentives" in the form of tax-saving deductions that could be passed on to their children. The final solution to rising health care cost could conceivably be Physician-assisted Suicide via the bottom of the "Slippery Slope of Physician-assisted Suicide." At the bottom of this slippery slope is the "Abyss" in which physicians will have achieved physician-assisted suicide of the medical profession's noble traditions. If the medical profession ignores these noble traditions by counseling, endorsing and carrying out physician-assisted suicide, patient trust in physicians will be decimated and an outright lack of public respect for the medical profession will ensue.

By coupling "physician-assisted" with "suicide," physican-assisted suicide becomes a euphemism for "suicide" since it implies that a suicide that is physician-assisted is a medical treatment and therefore morally acceptable. In direct opposition to the ancient and noble traditions of the practice of medicine, physician-assisted suicide is in reality an oxymoron of the first degree. For centuries the Hippocratic Oath was administered to all physicians prior to their admission to the practice of medicine. People are amazed to learn that currently practicing physicians who took the Hippocratic Oath are a rarity and are an endangered species. The abandonment of the administration of the Hippocratic Oath to graduating medical students in this country was the key that opened the door to "The Slippery Slope of Physician-assisted Suicide" in the 21st Century.

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Some Contradictions of Physician-assisted Suicide

Rev Paul Conner, OP, STD

What do the three words of our topic, "physician-assisted suicide," mean? Clarity about terms is always a fruitful beginning for discussion. *Webster's* defines *to assist* as "to give support or help" and to help as "to give aid that remedies or relieves," *physician* as "one skilled in the art of healing," and *suicide* as "self-destruction or taking one's own life voluntarily and intentionally."

The harmony between *to assist* and *physician* is immediately apparent to us, but so is the contradiction between these two and *suicide*. To truly "support, remedy or relieve" a person bent in mind and heart upon self-annihilation is a challenging issue, therefore, to physicians "skilled in the art of healing." *Fully human* assistance is required, one more complete than simply pharmacological or surgical expertise. Clearly, a contradiction as stark as life versus death, growth versus stagnation and help versus destruction is at play.

This contradiction is not that between compassion and heartlessness, for physicians must always be compassionate and, as we shall discuss, especially toward suicidal patients. Neither is it the contradiction between autonomy and helplessness, for physicians must try to help even dying patients regain control of their lives, often no mean charge. Instead, it is the two-fold contradiction for the patient of choosing to end choice and existence themselves and to act counter to the deepest of human inclinations-to live. And it is the two-fold contradiction for the physician of choosing to ratify the patient's contradictions rather than to honor the principal demand of his or her profession: positively to assist, remedy or relieve a desperate patient. My remarks will be limited to some main moral concerns about cases of competent patients and of those competent at the time of determining advance directives.

A Form of Euthanasia: A consideration of euthanasia, of which well-meaning physician-assisted suicide is a form, will help resolve these contradictions for both patient and physician. Euthanasia is not a simple moral choice like stealing or lying. These have *single-component meanings* and can be done for their own sake or for some attached motive which adds to their meaning. *Webster's* tells us that stealing means simply "to take the property of another wrongfully," while lying means "to deceive another about the truth." Both of these actions harm rather than promote individual and social well-being, making them anti-human or immoral, not pro-human and moral, choices. Motives, however, can add distinct, even opposing meanings. Thus Robin Hood indeed stole, but in order to help the poor. And any of us can lie in order to spare ourselves harm.

Euthanasia is not as simple as stealing or lying. It is a compound moral choice, having a *two-component definition*. One component is the motive internal to its very meaning, and the other is the *action taken* to accomplish this motive. Hence *Webster's* identifies euthanasia as "killing . . . hopelessly sick or injured individuals in a relatively painless way for reasons of mercy." To want to end someone's misery is a merciful, compassionately pro-human motive, the admirable moral component of euthanasia. But to kill oneself or to help people kill themselves is clearly anti-human. Consequently, it is the action-component of euthanasia that is immoral. This is the familiar ethical contradiction of a good end, removing pain and suffering, not justifying an evil means: killing a person.

Precisely because of its complexity of

pro-human motive (end) and anti-human action (means), euthanasia has a potential for being misunderstood. People who focus so much on its humane goal of mercy that they do not take into rightful account its inhumane means of destruction cannot evaluate euthanasia objectively as either a personal (the patient), professional (the physician) or public policy (the legislator or voter) choice.

Despite confusion, however, everyone realizes that to exterminate a human being is an action directly hostile to the basic well-being of the person killed. All societies have banned direct killing of human beings. It may not be as obvious why this ban must hold in extreme circumstances. Aside from sound religious reasons, respect for human life stands inviolate against even severe challenges because of two facts.

The first fact is simply that human beings exist at all is completely gratuitous. That none of us has brought ourselves into existence argues against an assumed right to take ourselves or others out of existence. The second fact is as simple: none of us has made our humanness to be what it is. Both our human make-up and existence are gifts that call for intelligent, responsible choices for personal and social development rather than for contradictory, irresponsible choices that result in neglect, abuse or even destruction.

None of us has, therefore, an "absolute" autonomy, which actually self-destructs by ignoring what gives us substance, existence and freedom itself and by choosing to end all of these. We assuredly have relative autonomy, however, which both respects what we and our freedom are wholly dependent upon and chooses clear-sightedly-and courageously in trying circumstances-between what fosters and what injures our very humanness.

Mercy Without Killing: Should the humanly contradictory choices for suicide and assisted suicide be excluded, are there viable, ethical alternative choices for patient and physician? A successful three-part alternative is in fact available. This compassionate, fully human response is made up of:

1. A *reasonable assessment* of what medical care to give or not to give each suffering, dying person. Such a determination, made primarily by patients or their surrogates but with needed information and help from family and healthcare personnel, will yield treatment decisions that avoid excessive burdens for patients and all others. The significant medical and non-medical circumstances of each case to be assessed may be numerous. These may include the patient's physical, psychological, moral, and financial resources and personal values and desires; the ordinary or extraordinary character of the proposed treatment for this case; and the stress and cost of this treatment for family, caregivers and society. If this itemized and global assessment determines that a given treatment would be or has become disproportionately negative, ie, more burdensome than beneficial, the treatment is morally non-obligatory and may be refused or discontinued. There is nothing ignoble in accepting the human condition before unavoidable death.

The rational aim of this assessment is to avoid undertreatment and overtreatment. In nearly all cases, therefore, decisions taken upon a thorough appraisal alone will prevent people from being killed through some form of neglect or from being kept alive unreasonably, "as vegetables," and at unconscionable levels of expense, human suffering and effort.

2) The most advanced treatment for pain relief, called *palliative care* or *pain management*. Few physicians have been trained sufficiently in this new specialty needed to pursue the mercy of euthanasia without the killing. If administered correctly, analgesics can make virtually all excruciating pain and debilitating anxiety bearable.[1] Should a necessary increased dosage of drugs result in the unwanted side effect of shortening a patient's life, this choice for mercy is not tied to wanting to take one's own or another's life and hence retains its pro-human, moral integrity.

Besides expertise, however, effective pain management requires of the physician a caring involvement and the time and effort to adjust drugs to the patient's wishes, changing condition and response to medications. This combination of compassion and competence regularly achieves marvels of relief formerly unknown.

3) *Hospice-like care*. Hospice care emphasizes the compassion of euthanasia but excludes its killing. This worldwide movement has rediscovered what devoted families and their dying members have known from time immemorial, namely, that despite all odds we are capable of surprising greatness of character if supported lovingly up through our last moments.

By contrast, a major consequence for most competent patients dying in loneliness, even though they receive the best medical care, is a dramatic lowering of their threshold of bearing pain and suffering. Discouraged, from facing death alone, to the point of hopelessness, these people often experience exaggerated fears that rob them of their usual abilities to deal with adversity. They can become candidates for suicide, assisted suicide, or policies of euthanasia. Also, by requesting euthanasia they may confusedly be trying to test the hearts of relatives or the determination of physicians to try their best. If tormented and terrified, they may be tempted to see themselves as useless, helpless, abandoned and burdensome.

The hospice movement sees them quite otherwise. It regards their cries for assisted suicide as cries for attention and love, their devalued self-image as temporary blindness to their true personal dignity and their suffering as something manageable with possible positive gain.[2]

Above all, what hopeless, dying patients with intractable pain do not need is familial or professional confirmation of their depressed, despair-filled self-view. Stricken and defenseless before those healthy and strong, they need instead competent palliative care together with human interest and affection. Trained and caring physicians are the best source of compassionate pain relief; family and friends are the best source of personal concern and willingness to support the patient lovingly until the end. Yet, when family and friends are absent, normal human exchange and encouragement from healthcare personnel have proven enough to banish despair and give heart to those suffering and/or dying.

Properly cared for, most competent patients retain or regain their normal abilities to cope with serious challenge, and most often these desire to rise to the occasion. In doing so hourly and daily, they see their own character strengthen in unsuspected ways. They become energized by a certain hope, for they somehow sense the call of courage still to grow as persons despite what oppresses them. Growth in character and interpersonal relationships can occur despite bearable pain and anxiety. Hence sickness and dying are not seen merely as cruel absurdities from which to escape at all costs. On the contrary, it can make clear sense to these terminal patients not to end their lives by their own doing. Such patients may even be conscious of leaving an inspiring example to family, friends and caregivers of not being overcome by misery or despair but of reaching their most noble experiences of self-understanding, reconciliation, commitment, endurance, and indomitable autonomy.

Moreover, these patients may well have occasioned memorable responses from those around them: empathy, love, understanding, admiration, selfless concern and effort. In short, the last struggles of those dying can turn out to be their best and can have an irreplaceable meaning and value for all concerned.

Escaping Contradiction: Patients and physicians can escape the contradictions of assisted suicide. Both can take fully pro-human decisions about the two defining components of euthanasia. Both can validate the goal or motive of mercy through making pain and anxiety bearable and

through supporting courageous living and growing to the fullest extent possible. Both can reject killing as an anti-human means.

Non-euthanasic physicians may even grow in character the most! At least they avoid practicing a contradiction at the heart of their profession pledged to help people even in their most painful terminal stages of life. They avoid any complicity in extinguishing human life. They may learn ever better to confront, not evade, death, to counteract fear and defeatist attitudes and to help their patients die well as real human beings. They surely will develop in genuine compassion, that unresisted co-suffering with their patients which leads physicians to increasing empathy and which motivates them to become expert in palliative care. Thus they may provide for and behold the birth of human greatness in their patients and in themselves. A result they may also see is that some families will entrust their fragile and cherished members to their care time and again.

No one is ever absolutely compelled to say yes to euthanasia or to physician-assisted suicide. Individually and socially, we can always say no. Nothing so predetermines human beings as to make us completely unable to resist what is humanly destructive or to pursue what is humanly up-building. Possessed of intelligence, imagination, and real but relative freedom-and blessed with the possibility of genuine help from others-we can refuse to choose when there are only immoral options and choose to suffer positively when sickness or dying eludes our best efforts. It is in such compassionate and courageous ways that both patient and physician can escape contradiction and attain the heights of dignity of which human beings are capable.

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Through the Looking-Glass of Abortion: Euthanasia and Physician-Assisted Suicide, Whose Choice Is It?

Rev Janet Cooper Nelson, M Div

The current conversation raging in the nation about euthanasia and physician-assisted suicide keeps wending its way toward the Supreme Court. Ethicists, physicians, and theologians either craft procedure and policy or craft language to decry the very idea of such procedure. The proceduralists attempt through refinement to respond to the requirements of the prohibitionists. The first group argues that they are simply making public, and therefore more standard, the policies that are already private practice among many physicians. The second group contends that this is either false accusation or disclosure of gross misconduct by physicians. The binary, passionate tone of the contention between the points of view lead us to believe that only the voice of the high court will settle this dispute definitively.

But the sound of this conflict is also strangely familiar; those ringing words *choice* and *life* remind us that we know better than to believe the matter will be settled by the sharp rap of the gavel. Two decades of bitter wrangling in this country have taught us that creating law to insure the availability of medically safe abortion does not settle the conscience of those who understand that law to be in violation of an inalienable "right to life." Retrospectively, the continuing struggle about abortion may be useful in establishing a less divisive future for the current national debate about our "right to die," particularly because, like abortion, the exercise of that right seems to require the assistance of a physician.

No intelligent discussion of euthanasia and physician-assisted suicide can proceed without an awareness of the etymological change that our national nightmare with abortion has created. This change is foundational and reveals that Rowe altered much more than the law. Whether Americans have been conscious participants in the varied advocacies that have emerged in the last two decades, we are ensnared within a highly charged political context by the pivotal words *choice* and *life*, which no longer convey content simply. Their meaning is freighted with nuance from the abortion context that clouds but also may be able to clarify. The coincidence of language in the two areas of discourse is not singular. The initial inconvenience of having to be conscious of the influence of the abortion debate is outweighed by the ways in which a consideration of some of the aspects of that debate may be fortuitous. If nothing else it gives us clear signals that we must proceed self-consciously.

Any serious and authentically American proposal to establish norms for legal and ethical conduct of physicians with respect to a patients "right to die" must proceed with a keen consciousness of the volatile burden of politicization that the abortion discussion places. The poet Denise Levertov suggests in her poem *Stepping Westward* (about other historic feminine frontiers) that some burdens are important, even nurturing, to bear. She writes: "If I bear burdens, they begin to be remembered as gifts, goods, a basket of bread that hurts my shoulders, but closes me in fragrance, I can eat as I go." We must struggle to receive, in an almost sacramental sense, the voice of our national wrangling as that of our collective conscience. We must search for the clarifying principles and narratives that will join conviction and compassion for good purpose.

In the biblical texts the moment seems so clear. Moses' final instructions to Israel on the verge of Jordan and the Promised Land included these words:

> I call heaven and earth to witness against you today that I have set before you life and death, blessings and curses. Choose life, so that you and your descendants may live loving the Lord your God obeying him and holding fast to him; for that means life to you and length of days, (Deuteronomy 30:19-20)

We find no such simplicity in the line between life and death. Choosing life can mean acting to hasten death. The nature of a compassionate choice can often only be defined as over against almost certain misery. The human choice that confidently places the ultimate keeping of life and death in eternal hands must begin with an acknowledgement of the partialness of our knowledge, and our inability to know the future. But it must also be responsible for what we do know about pain, depression, isolation, hopelessness, the very real limitations of medical science, and the genuine variety within the human spirit.

Little of this complexity has been included in the abortion discussion within the confines of the community that opposes the legal availability of the procedure. The activity of this group has been directed at removing the medical option for those who would choose it, thereby preventing the "sin" of making that choice. Wrongful human choosing is the problem those who oppose abortion wish to correct.

What the 1973 Supreme Court decision

in Rowe v Wade insured was that a woman could, at her own initiative, seek the care of a doctor in the termination of a pregnancy. This change in the law obviated the need for women to seek back alley procedures and meant that these services and their providers would be subject to the standards of clinical and ethical scrutiny employed throughout American medicine. Prior to the Supreme Court ruling the availability in the nation of medically safe abortion was very uneven. Though technically illegal, an underground network of more than 1,500 clergy referred women who sought their counsel to a far-flung network of clinicians who performed abortions. Psychiatrists referred high school and college-age women to gynecologists at major medical centers around the country for operating room procedures that any clinician knew to be abortions.

Prior to 1973 no legal challenges were made to these abortion choices despite broad knowledge of them by the medical community and the involvement of clinicians whose religious communities have subsequently referred to abortion as holocaust. The sharp voice of dissent came after Rowe. What Rowe changed most dramatically was whose voice would be considered authoritative in choosing whether a particular abortion was warranted. Rowe did not decide whether abortion was morally or ethically justifiable. Rowe did not decide when fetal life can incur the full protections of law. Rowe did not change the way abortions were performed or the use of fetal tissue for research. Rowe changed whose choice governed whether an abortion would be performed.

Rowe made the pregnant woman's voice the determining factor in the abortion. Her choice no longer requires prior approval by clergy, psychiatrists, or physicians. Her case has merit because she says it does, not because a psychiatrist attests to the psychological risk the pregnancy would cause. No clergy person needs to intervene to establish the connection between the woman and a medical provider. The decision to seek an abortion resides as it did before Rowe with the person seeking. The change in the law provides a woman, seeking medical assistance to end a pregnancy, an assurance of finding it.

Since the passage of Rowe, opponents of the decision have cloaked their sentiments in children, motherhood, family and fetal life, calling themselves "pro-life" rather than "anti- choice." But the distinguishing protests of the movement have been directed at clinics where reproductive services are offered to their clients and their medical providers. If the movement's rhetoric were revelatory of its inner issues then adoption agencies, support for pregnant women, child care and nutrition efforts would be logical outgrowths. None exist in any serious measure. However. if the movement's central concern is whether women are adequate to the task of life and death moral decision-making without supervision, then its actions are credible.

Challenges have proposed that women do not understand what an abortion is and does. Statutory challenges to Rowe have sought to place funding for abortions outside the limits of federally provided health care, to require women to consider the mechanics of the procedures for at least 24 hours after making their request, or to include parents and fathers in the approval for the procedure. Despite the familiar rhetoric of "the sacredness of fetal life," only when Rowe authorized pregnant women to be the architects of their own future lives did that language emerge.

Why did the voice of moral outrage emerge subsequent to Rowe when it was silent before it? What can we expect if the courts support the legality of choices to die? Why have serious, even threatening and murderous accusations emerged about the ethical conduct of doctors? Why, when many attest to a long-standing practice of physician assistance with death, has the discussion of euthanasia and assisted-suicide prompted the cold, specter of a slippery slope where doctors might quietly, or even arbitrarily, kill those whose deaths are taking too long, or worse yet, costing too much?

These questions are fundamentally rooted in our concern about whose choices are trustworthy, and whose choices should be normative. Americans have been demonstrating for several decades a steady trend toward wishing simultaneously to delegate their ethical and moral choices to experts eg, doctors, attorneys, researchers, manufacturers. lawmakers, while also reserving to themselves the right to hold those experts liable in court for misconduct, misjudgment, imprudence, negligence, a failure to be omniscient. Sociologists refer to this quality in American culture as our litigiousness. The focus on the courtroom as the place where we will hold one another accountable for choices, good and bad, dictates the movement of euthanasia and physician-assisted-suicide toward that arena. But the real outworking of our national conscience will only occur when we realize that the availability of medical practice is not synonymous with our decisions as citizens to employ those practices. Perhaps if the Court can forbear, rendering only such decisions as are necessary for local interpretation of current practice, it will be possible for the citizenry, in all of its diversity, to retain consciousness of its role as choice-maker. We will still grapple with whether gender, age, education, class, or culture render adequate the choices of some.

The "right to die" is clearly best exercised by the one whose death is at issue. The physician's role unless s/he is the one dying, is that of midwife and expert, not choice maker. If that dynamic can remain more boldly and'continually stated in this moral paroxysm, we may be spared the mechanical relegation of human choosing to binary simplicity, and gain a glimpse of the magnificent human variety and complexity by which the creative choosing hand of divinity conveys human resemblance.

(Rev Janet Cooper Nelson, MDiv, is university chaplain at Brown University.)

Physician-Assisted Suicide: Three Cases to Consider

Edward N. Beiser, JD, PhD

One of my professors used to say: "It is impossible to paint a cloudless picture of a cloudy sky." I find it difficult to write about "physician-assisted suicide." Some of the confusion is no doubt my own. But I suspect that it is true that our society has confusing and contradictory notions with respect to this very sensitive and difficult topic. I present three cases to illustrate some of the tensions inherent in my own thinking about this topic.

Freehold, New Jersey

I remember a newspaper story of perhaps 20 years ago. A young man in Freehold, NJ was involved in a terrible motorcycle accident. He was rendered quadriplegic. Though fully conscious, he could control no functions below the neck. He pleaded with his family to "put him out of his misery." At a certain point, his brother came into the hospital armed with a 12 gauge shotgun. He placed the shotgun in the mouth of the quadriplegic brother and killed him.

The state prosecuted the brother for murder. The judge instructed the jury that there was no legal justification for a "mercy killing" in the Law of New Jersey. The jury in its infinite wisdom found the accused "not guilty" of all charges.

Students in my class raise their hands and say that they agree with that jury verdict. To be sure, it is easy to discuss such a case in a classroom or in a journal article. I don't know what I would have done had I been there. The Freehold case is a pure case of euthanasia: mercy killing. We might ask whether the victim truly, upon mature reflection, wanted to die. We could institute procedural safeguards to make sure that he was not depressed, that he was not sedated, that he had not been pressured to allow his family to obtain an inheritance were he to die at that point. In short, we could determine whether he was "competent." But if we did determine that he was competent, would we then allow him to arrange to have himself executed?

I posit the following questions for discussion:

1. Does it matter that the instrument of execution was a shotgun rather than a syringe or a pill or a scalpel or any other "medical" device? I suspect that it does not.
2. Does it matter whether the person who carried out the execution was a physician? That is to say, should we discuss this case in an ethical framework which applies to Everyman equally? Or should we think about this case as involving special ethical issues that apply solely to the medical profession? One might think about that question in two different ways. One might say that physicians, rendering medical care, should also render care resulting in death. If that were one's argument, then physicians would be permitted to do something which non-physicians (like the brother in Freehold) are not permitted to do. Alternatively, we might say that physicians ought to be held to a higher standard of behavior where human life is involved, such that even if other persons are permitted to carry out "mercy killings," physicians are not.
3. A related question is: does it matter that this incident occurred in a hospital, as opposed either to another institution such as a nursing home, or whether our reactions would be the same had the incident occurred in the privacy of the patient's apartment.

The Freehold case as thus far presented is one of euthanasia. A very modest change in the facts will turn it into one of suicide. Suppose the victim of the motorcycle accident were indeed badly crippled, but did have the use of one hand. But he was located in a hospital, under considerable supervision, and was totally unable to leave his bed. He begged his brother precisely along the lines of the original story. The brother returned to the hospital with a loaded pistol. He placed the pistol on the bed table. He kissed his brother good-bye, and left. The patient picked up the pistol, then shot himself, death resulting. Suicide? Clearly so. Assisted suicide? I think so. The same or different than the case in which someone other than the victim pulls the trigger?

Donald's Case

Donald was a graduate of Brown University and of a distinguished law school. When he was about 30, he contracted AIDS. He aggressively fought to live. He obtained caring medical attention, and was supported by his family. Donald's hospitalizations increased, and his prognosis grew increasingly grim. He entered the hospital for what turned out to be his last stay. He brought with him a stash of medication, which he had prepared for this occasion. His purpose was to permit himself to commit suicide when he felt that he wanted to. During the course of his hospitalization, a nurse discovered the bottle of pills in Donald's bed table. The nurse informed a physician, who removed the pills. Donald protested violently that he ought to be given the medication which would allow him to commit suicide when he wanted to. The physician refused to return the pills.

The following questions deserve our careful consideration:

1. Is there a difference between removing the instrument of potential suicide (the pills) and providing them when requested to do so? That is, Donald brought the pills into the hospital on his own. Is this different than the case where he requests his brother to produce the pistol in Freehold?
2. If Donald had lost his stash of pills, should he have been able to request his physician to provide him with the means of suicide, well in advance of his anticipating their use?
3. How should a caring physician respond when Donald asks for instructions as to what pills he might appropriately utilize were he ever to want to commit suicide? Should a physician write a prescription for that medication?
4. Is there a difference between actively writing a prescription knowing that it's purpose is to permit the patient to commit suicide, and failing to remove that medication from the patient's bed table when the nurse has determined that it is present?
5. Once again, is the role of a health care professional (a physician, a nurse, a physical therapist) the same or different than the role of any other citizen? If I, as Donald's friend, had noted that he had this stash of pills with him in the hospital, should I have removed them? Should I have notified the physician? Should I have notified Donald's family?
6. Should we be interested in Donald's motivation? That is, as long as we know that he is competent, if he wishes to consider suicide, is it our place to evaluate his reasons? I am reminded of the cartoon which depicts a Boy Scout assisting an elderly person across the street. She beats him over the head with her umbrella saying "I don't want to cross this street." An argument based upon autonomy as the dominant or primary ethical norm would suggest that it is only for Donald to judge Donald's reasons.

An argument based upon natural justice, or on community values, might be willing to restrict Donald's choices.

Marsha Gray's Case

Marsha Gray was a delightful lady in her mid-40s who suffered an unanticipated and devastating cerebral hemorrhage. Her family obtained the best medical care possible. After several years, it became obvious that Ms Gray would continue to live in a persistent vegetative state with no hope of recovery. She was fed through a G tube a state medical institution. Ms Gray's family requested that tube feeding be discontinued; the state authorities refused. The explicit purpose of discontinuing the tube feeding would be to bring about Marsha Gray's death.

In an opinion which is the controlling law in Rhode Island at this time, Judge Boyle held that an adult competent patient has a federal constitutional right to refuse life sustaining medical treatment. That personal right continues to exist even when the patient is not competent to express his or her wishes, if there is unambiguous evidence of the patient's desires. Judge Boyle held that there was sufficient indication as to what Ms. Gray would have wanted under that set of conditions, and he ordered that the feeding tube be discontinued. He mentioned in passing, with no particular justification, that, of course, this was not a case of suicide.

I am supportive of Judge Boyle's decision in the Marsha Gray case. I think an adult competent patient should be permitted to refuse medical treatment even if death will result. I do not understand why this is not suicide in precisely the same way that the use of a pistol in the Freehold case or the use of an overdose of medication in the case of Donald would be suicide. To clamp a G tube strikes me as identical with shooting a bullet or ingesting medication. Surely if the patient had ripped out the G tube, the parallelism would be obvious. Could the patient then refuse to permit the insertion of another G tube?

There are those who argue that there is a distinction between active and passive euthanasia. I am persuaded by the literature that says that this distinction is a word game, without moral significance. At the present time, we say that a patient has an autonomy right to refuse efficacious medical treatments, even if fully informed that death will result. At the same time, our emergency rooms routinely treat patients who have attempted to commit suicide. Furthermore, we refuse to permit health care professionals-or anyone else for that matter-to assist a patient in committing suicide. I do not know how to paint a cloudless (consistent) picture of this very cloudy moral sky.

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THE RHODE ISLAND MEDICAL JOURNAL HERITAGE

90 Years Ago
(August 1905)

William E. Wilson, MD, of Pawtucket writes on a radically new form of treatment for inoperable cancer. The author first presents the views and findings of Dr Coley who had isolated a streptococcal toxin which may retard or even reverse the growth of malignant tumors. Next, the author summarizes the published cases in which this nonsurgical therapy has been employed, adding two recent cases of his own. The notion that a bacterial extract may impede cancer progression was first proposed by Fehleisen, in 1883, who noted the regression of both sarcoma and carcinoma when patients spontaneously contracted erysipelas. In 1891 Coley began a series of therapies, particularly in sarcomas, using intentionally induced erysipelas, which convinced him of the merit of his toxins. Ultimately, Coley used filtered extracts of both *Streptococcus erysipelatis and Bacillus prodigiosus* in his toxin-serum rather than the induction of the disease. Coley emphasized that the toxins must be freshly prepared and must be derived from very virulent strains of bacteria. Other authors, including W.W.Keen, obtained neither cures nor even remissions following this treatment. The two new cases presented by the author showed some positive results, but the Coley toxins were used in conjunction with deep X-ray therapy, also a new form of therapy. The author recommends that these two nonsurgical forms of therapy be considered as adjunctive to each other. He concludes: "It is a source of gratification to the physician that he may not only be able to cure even a small proportion who might otherwise die, but that there is hope that by some change in the preparation of the toxins or some further improvement in the technique of the X-rays, the percentage of cures will be increased."

G.T.Swarts, MD, secretary of the state Board of Health, writes on the state and its responsibilities in the detection and treatment of diphtheria. He notes that other jurisdictions, beginning with New York City in 1893, made their bacteriology laboratories available to practicing physicians for the identification of the diphtheria organisms. Older physicians may have been sceptical of the value of this procedure, relying rather upon their clinical judgment in recognizing the constitutional symptoms of the disease. The Rhode Island legislature, ". . . ever mindful of the practical application of its funds, gave the appropriation willingly and from the year 1894 to the present has, with alacrity, set aside sufficient funds for the Board of Health for this purpose." Cities, such as Pawtucket, have also provided care for victims of smallpox, scarlatina and diphtheria, occasionally dispensing diphtheria antitoxin as well. Most of the antitoxin used in the state, however, was purchased commercially by the patients or their families. The author then discusses the relative efficacy of each state maintaining its own vaccine and antitoxin production facilities. He concludes that the great cost of maintaining such production resources may be too much for small states (such as Rhode Island) but that a large state (such as Massachusetts) with local experts in the control of such biologicals should definitely embark upon such a course.

The minutes of the 94th annual meeting of the Rhode Island Medical Society are published. The annual income of the society is now $2,150.68. Summaries of various committee reports are included. The Committee on Legislation reports that the proposed School of the Feeble Minded had made little progress owing to the opposition of some members in the State Legislature. The bill for the state registration of nurses "was lost as a result of the wishes of nurses of the RI Hospital to control the matter." An anti-narcotic bill was opposed by druggists and hence was defeated in the legislature. A report of the Library Committee noted that 967 new volumes were added, with total bound volumes now approaching 20,000.

The bimonthly report of the health of Providence, summarized by Charles V. Chapin, MD, is published. One case of small pox, imported from Canada is listed. There were 14 deaths from spinal meningitis during this interval, but only 77 cases of diphtheria, with 11 deaths - a slight decrease when compared with prior months.

50 Years Ago
(August 1945)

The surgery of the veins of the legs, varicosities and some problems in thrombosis are discussed by John Homans, MD, clinical professor of surgery, Harvard Medical School. The author begins with a detailed exposition of the venous drainage from the lower limbs and the factors which increase the likelihood of varicosities, stasis and thrombosis. He then considers the dangers of "quiet thrombosis, phlebothrombosis" par-

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ticularly as the precursor of pulmonary embolisms. He states: "Thrombosis of the deep veins is recognized as a common phenomenon, occurring under a great variety of conditions. The form giving rise to embolism is deep and quiet. The outspoken form - thrombophlebitis - is usual a late stage of the quiet process, now called phlebothrombosis. Surgical and nonsurgical means of halting thrombosis and forestalling, or putting a stop to, embolism are indicated and the next few years should see an intelligent standardization of the available means of treatment."

Jacob Gershon-Cohen, MD writes on internal derangements of the knee-joint and their X-ray diagnosis. The author, chief of radiology at the Newport Naval Hospital, comments that the number of patients with chronic derangements of the knee will inevitably be augmented by the return of war veterans to civilian life. He emphasizes the importance of a careful history, physical examination and X-ray studies including visualization of the menisci. There follows then a discussion of the nature of internal derangements, loose bodies, sprain or rupture of the tibial collateral ligament, periarticular bursitis, cysts of the menisci, neoplasms of adjacent bone and miscellaneous soft-tissue conditions.

A discussion on causes of cancer is provided by Stanley P. Reimann, MD. The author emphasizes the role of carcinogens including X-rays, and newly identified viruses which may be implicated in the etiology of neoplasms. He discusses, too, the genetic transmission of neoplastic tendencies.

The lead editorial discusses the fundamental issues in establishing a national health insurance leading to "... a system of some sort that will bring the benefits of modern medicine, preventive and curative, within the reach of the person of moderate or low income." Two components are considered. First, the need for extensive construction of new hospitals and second, some form of prepaid health insurance. Arguments for and against compulsory health insurance are presented.

25 Years Ago (August 1970)

Professor Peter Donaldson discusses family planning and the various methods, including contraception, that people use to accomplish this. The findings are based upon a sample of 1,127 households in Rhode Island. The author concludes: "Data on the sources of information for contraceptive methods have been presented. Two important conclusions can be drawn from this analysis. First, doctors are important distributors of knowledge about birth control. Second, doctors are not equally important in the adoption of all means of birth control. Among those using the more traditional methods, such as the condom and withdrawal, the spouse is the more important source of knowledge. Doctors, however, are very important in informing women of the oral contraceptives. It seems reasonable to suggest that if more women continue to employ this method the influence of the doctor will grow."

James A. Yates, MD, discusses and evaluates the pharyngeal flap operation for velopharyngeal incompetence, reviewing 47 cases. Twenty eight of this group had both pre- and post-operative voice recordings and were studied in terms of the degree of improvement following surgery.

Mahamed Kakvan, MD, discusses progress in coronary heart disease rehabilitation. He states that there is accumulating evidence that strongly indicates that physical fitness and training yield substantial benefits in preventing myocardial infarction.

The physician's obligation in developing managerial skills in the administration of health care facilities is discussed by John S. Spratt, MD.

Jule M. Hannaford, attorney for the Minnesota State Medical Association, offers a paper entitled: "Abortion: Crime or Privilege?" The author believes that the issue will be resolved, not by legislature, but in the courts of law.

The journal summarizes the purpose, implementation, financing and benefits of seven currently considered health insurance plans.

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MEDICINE

September 1995

Volume 78, Number 9

Management of Carcinoma of the Breast

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Cover: 19th century etching of a consoling woman.

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COMMENTARIES

Therapeutic Strategies for the Management of Carcinoma of the Breast

I am indebted to RHODE ISLAND MEDICINE for the opportunity to present to Rhode Island's medical audience papers devoted to the management of breast carcinoma. Currently, breast carcinoma is the most common neoplasm occurring in women and affects approximately 1 of 8 women, according to life-time risk analyses. Additionally, 1 of 2 women is evaluated by a physician for concern about a breast mass; 1 of every 3 to 4 women in the United States undergoes a biopsy for suspicious breast masses. The papers presented in this issue, therefore, are selected to provide the general practitioner, internist, surgeon and radiation oncologist with a review of some of the contemporary and contentious issues relating to treatment of this organ-specific cancer.

The radiologist's role in the diagnosis of breast cancer has been altered significantly over the past two decades with increasing use and acceptance of mammographic screening. Our profession has witnessed remarkable enhancement in both quality of mammograms and the application of this screening tool to provide the diagnostic radiologist an opportunity to detect occult neoplasms well before they are palpable, and in many cases, before they are invasive. Barbara Schepps, MD, and Francis Scola, MD, radiologists at the Rhode Island Hospital and the Women and Infants Hospital, review the contemporary diagnostic approaches available to the radiologist for diagnosis of non-palpable lesions. The increasing incidence of breast carcinoma is most probably a result of the improved diagnostic capability of imaging technology. This frequency in diagnosis is reflected in the increasing diagnosis of *in situ* lesions of ductal and lobular origin. Fifteen years ago the diagnosis of ductal carcinoma *in situ* (DCIS) represented only 2% to 5% of carcinomas; currently DCIS accounts for 20% to 40% of all breast carcinomas evident in a mammographically screened population and is 12% to 15% of all breast cancer diagnoses. These authors review contemporary diagnostic approaches and the results evident with diagnostic mammography, breast ultrasonography, MRI, radionuclide imaging, and needle-directed biopsies applying modern stereotactic methodology.

This article is followed by an overview by Dr Russell White and myself for the management of *in situ* carcinoma of the breast. This review embraces both ductal and lobular lesions and presents the determinant risk for each entity, its typical clinical presentation at diagnosis and current therapeutic options. Both lesions warrant major consideration of the therapeutic approaches as the implications of diagnosis necessitate profound variations in therapeutic approaches for each lesion. The unanswered queries regarding the necessity of radiation in certain of these histologic subtypes have not been clearly answered. Future prospective studies will attempt to evaluate these concerns.

Newer approaches in breast conservation surgery for the management of both invasive and *in situ* lesions are provided by Dr Gabriela B. Masko and associates, a highly experienced radiation oncology group at the Roger Williams Medical Center. The specifics for surgical considerations, including placement of operative incisions and interpretation of the pathological results, are provided in this study. These authors also review oncology team planning and outcome data relative to radiation with conservation management.

Major contributions to the therapy of breast carcinoma are acknowledged by Gianni Bonadonna and associates of the National Tumori Milano for the management of stage II (node positive) disease. Nearly two decades ago, these investigators confirmed that adjuvant systemic therapy following diagnosis of regional disease enhances disease-free and overall survival. These results have been further confirmed in Dr Wallace L. Akerley's paper. The improved approaches using cytotoxic chemotherapies and hormonal measures for both pre- and post-menopausal patients are addressed by this author.

The integration of multimodal approaches is perhaps as important in the management of breast carcinoma as for the management of any solid neoplasm. Multidisciplinary planning, implementation, and therapeutic approaches are essential to maximize cosmesis, function and provide a sustained, durable disease-free and overall survival. The integration of these concepts for the management of locally advanced breast carcinoma is discussed by Dr S. Eva Singletary of the Department of Surgical Oncology, University of Texas M.D. Anderson Cancer Center, Houston. Dr Singletary emphasizes that management of locally advanced disease is maximized by a team approach to multimodal care. Additionally, the physician who supervises the delivery of oncology care must be a sensitive and involved listener incorporating the patient's perspectives and goals so as to achieve these personal and therapeutic objectives. Therefore, emphasis is placed on the patient who should be empowered to participate actively in the decision-making process for treatment of stage III and inflammatory carcinoma.

Current theory suggests that carcinogenesis arises from biologic, physical, chemical, and/or genetic insults within the cell cycle to produce aberrant DNA replication with resultant neoplastic changes. We currently recognize the following causative factors: occupational and ambient chemicals, smoking, radiation, dietary factors, cellular promoters for hormone-responsive tissues and genetics. Dr Manoussis M. Konstadoulakis and myself address the integration of cellular and molecular concepts for

strategic therapies applying contemporary molecular biology. The more meaningful contemporary developments in breast cancer research have occurred in the last 2 years with the isolation of the first gene definitely linked to carcinoma (eg, BRCA-1 gene). Cloning of the BRCA-2 gene and identification of its mutation is imminent and will represent a major contribution of molecular biology to defining and predicting breast carcinogenesis. This brief review provides the reader with an overview of oncogenes and their expressed role in breast carcinogenesis and explores the future of gene therapy. The use of these molecular genetic blueprints may provide future generations with preinduction identification of individuals with a sustained risk for development of neoplastic change. Further, these genetic markers may supplant or supplement contemporary clinical and traditional pathological markers applied in prognostic and therapeutic implications for management of the disease.

The final two papers deal with the most contemporary and contentious aspects of breast cancer management. For many women who have survived breast cancer, and particularly for those who had menopause prematurely induced by therapy, the clinician must consider the risk of estrogen replacement therapy, since benefits for both symptom control and prevention of long term consequences of menopause may be substantial. Currently no treatment for menopausal symptoms is superior to estrogen therapy; but there is no agreement regarding the safety of estrogen replacement in post-menopausal breast cancer survivors. Dr Michelle Cyr of the Brown University School of Medicine addresses estrogen replacement therapy in the post-menopausal patient with breast carcinoma. This author emphasizes that the patient with breast cancer, not the physician, ultimately decides the risk that is acceptable to justify the benefit of therapy. While trials are in progress to address the important question of hormonal replacement in the post-menopausal patient with carcinoma, each decision to use this therapy must be individualized with careful presentation of the data and advice from the perspective of informed consent. Dr Cyr emphasizes the necessity of consensus and cooperation between physician and patient to better optimize individual needs and results with this therapy.

The final study is provided by Linda Laliberte, JD, MS, and associates in the Center of Gerontology and Health Care Research at Brown University. These authors examine the psychosocial status of breast cancer patients in Rhode Island within 1 year of their diagnosis. These authors examined sociodemographic, treatment and psychosocial factors by age to identify the differences in the breast cancer experience for young and old women. Thereafter, a study was initiated to determine whether these variables were related to emotional distress. Younger patients (under 55) experienced more psychosocial morbidity than older patients (over 55). High emotional distress in patients was related to problems that were work-related, financial, or multiple in nature, and to the severity of pain. An important finding of their study was that patients with high social or practical support registered much lower emotional distress than those patients with little social or practical support. Physicians could alleviate much stress in their patients by attention to such details as providing a person on staff to communicate with patients, providing pain counseling services, and providing information on support services and groups. Another purpose of their presentation was to discuss the benefits of support groups in mitigating emotional stress and provide the readership with a comprehensive listing of supportive services provided in hospitals in the state as well as sponsors of various programs in Rhode Island.

I am deeply pleased with the opportunity to serve as guest editor for this issue of RHODE ISLAND MEDICINE and to present to the physicians, nurses, paramedical personnel and the lay public of Rhode Island the various diagnostic, therapeutic and evolving molecular biology strategies for the therapy of various stages of breast cancer. The challenge of this common tumor takes on increasing significance in industrialized societies and this issue of RHODE ISLAND MEDICINE serves to document the progress and major contributions of the investigator scientists and clinicians involved in the therapy of breast cancer.

Kirby I. Bland, MD
Guest Editor

A Bumper-Sticker Crop of Words

Society provides us with a range of venues should we wish to put forth important messages to the reading world. At the bottom of the ladder of social acceptability is back alley graffiti, and at the top, immortal epigrams carved in marble. The merit and imperishability of the message, of course, ultimately depends on the writer's words, not the surface upon which it is written.

Horse-drawn wagons may have carried some inscriptions (perhaps, "California or Bust") but it required the invention of the automobile—and particularly its rear bumper—to provide a readily accessible surface for those compelled to flaunt their views, aspirations, or beliefs before fellow travelers.

Political preferences were one of the first to proliferate on bumper stickers. By the 1950s, one could conduct a preference poll for a forthcoming election merely by standing at some busy intersection, counting the stickers favoring each of the candidates.

From these humble beginnings, the bumper sticker has relentlessly expanded its voice to include such diverse assertions as the travels undertaken by the vehicle ("*This Car Has Climbed Mount Washington* "), the owner's tastes in pets ("*I ♥ Paramecia*"), the call-letters of the local rock radio station, the accomplishments of an offspring ("*My Son Is an Honor Student at Winnie-the-Pooh Nursery School*"), ethnicities ("*I'm Proud To Be Nepalese*"), points of view ("*I'm neither for nor against apathy*") and courageously moral stances ("*I Brake for Penguins*").

Clearly, the possibilities in bumper-sticker notices were endless; and inevitably they have finally touched upon physicians and the practice of medicine. While these can be viewed on the open highway occasionally, they are best observed in hospital parking lots.

Many are basic and can be readily adapted to any specialty: ("*When Did You Last Hug Your Colorectal Surgeon?*" or "*I ♥ My Endocrinologist*"). Some proclaim an interest in furthering organ transplantation: ("*Don't Take Your Organs to Heaven. Heaven Knows That We Need Them on Earth*" or, more bluntly, "*Transplant Kidneys, Don't Bury Them*"). A few signify an allegiance to a psychotropic medication: ("*Honk If You Are On Lithium.* ") Others present an ethical stand: ("*I Can Live Without Capital Punishment*") and some merely serve to educate the literate public ("*Rabies Kills*"). There are hidden delights in the ambiguities that some words or phrases may yield. An innocent phrase—on or off a bumper sticker—such as "*Void Where Prohibited*" takes on ominously antisocial meanings when read by a urologist.

Veterinarians and the American Humane Society sponsor a thoughtful bumper sticker: "*Don't Litter: Neuter.*"

Some bumpers, sadly, now carry stickers advocating one beer or another—an inept way of promoting the separation between drinking and driving. One particular liquor advertisement, however, highlights the absurdity of recommending alcoholic beverages, by proclaiming: "*Jamaica Rum: It's Not Just a Breakfast Drink!!*" Phrases

employed by Alcoholics Anonymous, often in iridescent lettering, are also commonly appended to bumper stickers. Condemnations of drug usage ("*Nope to Dope*", "*Reality is for persons who can't deal with drugs*") are also becoming increasingly common.

In recent months, the most erudite, and certainly the most challenging, of bumper stickers was noted gracing the rear of a high church officer's car in Providence: "*Sic Hoc Adfixum In Obice Legere Potes, Et Liberater Educatus Et Nimis Propinquus Ades*," which roughly translates to: If you can read this bumper sticker you are both well-educated and too close."

But beyond whimsy, caprice or vanity, why would anyone even wish to adorn a shiny bumper with an opaque message? To identify with a cause? Perhaps, but would you entrust your inner beliefs to a chromed bulletin board? Is your imprinted manifesto really of sufficient merit to justify impressing itself upon the neutral minds of strolling pedestrians, or worse, distracting passing drivers? If it were a universally accepted pronouncement, displaying it becomes pointless; and if it were controversial—no matter how ethically lofty—surely no one will be persuaded or dissuaded by a fleeting display of a few emphatic words.

The fact that the message generally sits on the rear bumper of a retreating car, like a parting shot, reinforces the belief that the driver is not really interested in a measured response to his declaration. The bald statement, like a bullhorn, informs in only one direction thus barring any reconciling or healing dialogue. The message is necessarily brief, and by its brevity dogmatic, uncompromising, even dictatorial. It is, in truth, a bizarre and hostile way of communicating.

Stanley M. Aronson, MD

Instruments of Change

From the gauze pad to the syringe to the scalpel, most articles of medical usage bear names that have descended—sometimes directly, sometimes circuitously—from wondrously diverse beginnings.

The name syringe, for example, harkens back to a less than admirable vignette in Grecian mythology. Pan, the shepherd god of Arcadia and a phallic divinity, is said to have devoted most of his energies to the raising of goats and the seduction of young women mortal or immortal. One day he caught sight of the chaste nymph, Syrinx, and pursued her relentlessly to the shores of the river Ladon. Syrinx's father, the river god, helped her to escape by transforming her into a reed indistinguishable from the thousands of other river reeds. In anger Pan cut down many of the reeds, after a while consoling himself by assembling them into a musical instrument now called the pipes of Pan. (Feminists have often contended that Syrinx's father should have directed his transformational powers against Pan rather than Syrinx.) Dried, hollow lilac branches have long been used as drinking straws or as stems for smoking pipes. With this attribute in mind, Linnaeus bestowed the name *Syringa* upon the lilac bush in 1735. The name was then applied to the tubular medical instrument, particularly the 19th century glass syringe, capable of delivering to or aspirating fluids from the human body.

A little known apparatus, similar to the syringe, for the administration of enemata is the clyster. The word derives from the Latin, *clysus*, meaning to wash down or to drain. The word, cataclysm, a great deluge, stems from the same root. The clyster, incidentally, eventually become emblematic of the incompetent physician or quack (see Daumier's lithograph).

The Latin word, *tunica*, meaning a garment or covering, evolved both into the French, *tourner*, meaning to turn, and the Old French term *tourniquet* describing a replaceable undergarment (ie, one that could be turned over). The present day tourniquet defines a band which when turned or twisted compresses a limb.

The Hindu word *bandhu*, describes a piece of fabric which is first tied in knots and then dipped in a dye; the resultant fabric when unravelled and dried displays bizarre color patterns and is then called a bandana. The word *bandhu* also became the Latin, *bande* (a binding) and eventually the French and English word, bandage.

The word gauze, on the other hand, first described delicately woven cottons and was said to be named for the Palestinian city Gaza which, in the Middle Ages, was famed for its production of diaphanous fabrics. ". . . [V]ivacious beauty gleamed through gauze" rejoices the romantic Browning. From colder, less passionate New England, Emerson declares: "All the toys that infatuate men are the selfsame thing, with a new gauze or two of illusion overlaid."

The presumed origin of the word gauze reflects the French habit of naming fabrics after their city of initial manufacture. Denim, for example, comes from the French, *de Nimes* (ie, from the medieval city, Nimes); madras, from the Indian city Madras; jeans, from *de Genes* (ie, from Genoa); cambric, from the Flemish city Cambai; and satin, from an earlier pronounciation of the Chinese city Tsinkiang. Canvas, a fabric originally woven from cotton, flax and hemp, traces its name to the Latin term for hemp, *cannabis* (which is the formal name for marijuana, also a byproduct of hemp.)

The names of many medical instruments, particularly those made of metal, are de-

rived from the diminutive form of selected Latin nouns. The diminutive of the Latin, scalpere, (to carve or chisel), becomes scalpellum and in English, scalpel. Scalping, however, bears no etymological relationship to scalpel. The word scalp (the top of the head) is derived from the Anglo-Saxon, *scealu*, meaning shell (as in the word, scallop.) The diminutive of the Latin *lancea* (to launch, as with a spear) becomes the English *lancet*, spelled launcet until the 17th century. An internationally known medical journal, metaphorically at the cutting edge of biomedical science, is called *Lancet*. A pocket instrument carried by all practicing physicians of the 18th century was called the *fleam*. It was a modified, folding lancet used exclusively for blood-letting. Its name sounds quite Germanic but it is a contraction of the Latin *phlebotomus* (ie, vein cutting). Phlebotomus is also the genus name for the parasite-carrying sandfly.

The Latin *cura* meaning care or solicitude, is transformed into the English, cure, and its diminutive, curette. The Latin *specere* (to look at) becomes speculum, a surgical instrument to inspect an orifice. The Latin phrase *formi caps* (from *formus*, meaning hot; and *capare*, to seize) defines a pair of tongs to grasp hot objects; and, in English, it becomes the fused word, forceps. The English syllable, "ceps," confusingly, also represents an unrelated transition from the Latin *caput* meaning head (as in the word biceps, two heads.) The Greek *stethos* (the chest) combines with *scopos* (to look at, to examine) yielding the English word, stethoscope. Since the utility of the instrument depends essentially on what is heard rather than what is seen, Laennec might have been more accurate had he called it an audiostethometer.

The Latin *caesus* (to cut, to cleave) in English becomes the poetic caesura—a pause—and ultimately, too, the word scissors (as well as such words as schizophrenia and schistosomiasis.) The three Fates of Grecian legend were assigned by their gods a uniquely awesome function: to each mortal being they were to apportion a rigidly determined length of life, symbolized in Greek myth by a thread woven by Clothos, the first of the Fates. Atropos, the third Fate, then had the unenviable task of cutting this thread when its predestined length was reached. A pair of golden scissors remains the symbol of Atropos. The name of the third Fate endures in yet another way. Atropos in Greek translates as one who does not turn (ie, one who is implacable, remorseless.) Crude extracts of the deadly nightshade plant were known to cause irreversibly toxic effects in humans thus justifying its botanical name of *Atropa belladonna*; latter, its isolated alkaloid was called atropine.

Most orthopedic tools—splints, spicas, slings, crutches, clamps are of earthy Germanic origin, although a few (eg, brace, cane) do have roots in Latin.

What's in a name ? More often than not a lengthy etymological trail with intermediate cul-de-sacs of meaning. The pathway from the root-word is rarely direct; it stumbles, like a drunkard's route, from primitive meaning to metaphor to allegory to verbal simplification, vainly trying to fulfill the momentary needs of those earnestly seeking a title by which to identify new things.

Stanley M. Aronson, MD

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Contemporary Diagnostic Approaches for Nonpalpable Carcinoma of the Breast: The Role of the Radiologist

Barbara Schepps, MD, and Francis H. Scola, MD

. . . mammography is the single most significant improvement in the diagnosis of minimal breast cancer and is the most important tool of the radiologist in diagnosing breast cancer.

Breast cancer is the most common cancer in women in the United States and ranks second only to lung cancer in the number of women whose lives it claims annually. It accounts for 32% of all cancers and 18% of cancer deaths in women. The American Cancer Society predicts 183,000 new cases of breast cancer and 46,000 deaths from the disease in the United States in 1995. In Rhode Island there will be approximately 880 new cases and 240 women will die of breast cancer.[1]

The radiologist's role in diagnosing breast cancer has changed dramatically over the last 15 years with the acceptance and utilization of mammographic screening. Marked improvement in both the quality of mammography and its use as a screening tool have allowed radiologists to detect occult breast cancers years before such tumors become palpable. Screening mammography has not only given us the ability to detect breast cancer at an earlier stage but also has effectively changed the disease we diagnose. Fifteen years ago, the diagnosis of ductal carcinoma *in situ* (DCIS) represented only a small percent of breast cancers diagnosed but now DCIS accounts for 20% to 40% of all cancers diagnosed in mammographically screened patients and 12% to 15% of all breast carcinoma.[2] It is uncertain whether the actual incidence of DCIS is truly increasing or merely an apparent increase in patients diagnosed with breast cancer because of improved early mammographic detection.

While an increased incidence of breast cancer is noted, the age adjusted mortality rate has remained essentially constant from 1930 through 1989. Newly reported data from the National Cancer Institute has shown a decrease in breast cancer mortality from 1989 through 1993, with screening mammography cited as a primary reason for this decline in death rate.[3]

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Screening Mammography

In 1963, the Health Insurance Plan of Greater New York began a controlled study with 31,000 women each in a study group and in a control group. That study demonstrated that screening mammography and physical examination of the breasts together reduced the mortality from breast cancer by about 30%.[4] In 1973 the American Cancer Society and the National Cancer Institute began the Breast Cancer Detection Demonstration Project, which showed a confirmed reduction in mortality when compared with SEER data. It was also demonstrated that one-third of all the cancers found were smaller than 1cm, and those patients screened had fewer axillary metastases. One-third of the tumors detected were in women less than 50 years of age.[5] In the Swedish two-county study, Tabar demonstrated that those women screened had smaller tumor size at discovery, a decrease in lymph node positivity, fewer distant metastases, and improvement in survival.[6]

Screening mammography is the single most significant improvement in the diagnosis of minimal breast cancer and is clearly the most important tool of the radiologist in the diagnosis of breast cancer. Screening mammography identifies those patients who need further evaluation to diagnose malignancy. There are a variety of imaging procedures the radiologist uses to characterize screening findings to identify those patients who are cancer-free. There is also a cadre of interventional procedures used to obtain a tissue diagnosis or to direct the surgeon to the area of interest. The contemporary diagnostic tools used by the radiologist include a variety of diagnostic mammographic maneuvers: breast ultrasound, magnetic resonance, ductography, radionuclide imaging, digital mammography, fine needle aspiration biopsy (FNAB) or core biopsies guided by stereotaxis or ultrasound, sonographically or mammographically guided cyst puncture, pneumocystography, and preoperative needle localization.

Diagnostic Mammography

Dedicated mammographic equipment not only enhances the quality of screening mammography but also allows the radiologist to better characterize abnormalities found at screening. A mass is characterized by its location, shape, size, margins and density. Masses are better identified and delineated with compression spot views. A mass questioned at screening shown to have smooth margins with spot compression mammography is most likely benign. If the margins are clearly spiculated, malignancy is suspected. In some instances, a questionable mass may merely be the result of a summation of shadows and not a mass at all.

The finding of microcalcifications at screening warrants further evaluation with magnification mammography. The magnification technique requires the use of an air gap and a small focal spot to enhance the detail of the enlarged images. Magnification views permit improved evaluation of the size, density, shape, and number of microcalcifications. This improved visualization is useful in determining which clusters of calcifications have characteristics suggestive of breast cancer.

A host of other specialized views are beyond the scope of this paper but include rolled views, a variety of exaggerated views, and tangential views.

Breast Ultrasound

The primary role of breast ultrasound is to determine if a mass is a cyst. Sonographically a breast mass may be considered unequivocally a cyst if it is anechoic, elliptical with its long axis parallel to the skin surface (ie, the transducer), smoothly marginated with strong and uniform through transmission and changes shape with transducer pressure. There are times when all of these criteria are not met. This is a problem with older sonographic equipment and ma-

ABBREVIATIONS USED

DCIS: Ductal carcinoma in situ
FNAB: Fine needle aspiration biopsy
MRI: Magnetic resonance imaging
SEER: Surveillance, Epidemiology End Results
SMM: Technetium-99m sestamibi

chines that have poor near-field detail. Small lesions, less than a centimeter, also may not exhibit all the typical findings of benignancy. Cysts containing proteinaceous particulate matter will contain internal echoes; Brownian motion may be useful in distinguishing such a mass as a cyst. A solid mass demonstrating a vertical axis is typically neoplastic. However, most sonographically solid masses cannot be definitely diagnosed as benign or malignant. Sonography is neither sensitive nor specific enough to use as a screening tool for breast cancer.

Other indications for breast ultrasound include the evaluation of palpable masses not visualized on mammography, assessment of developing mammographic densities, and the characterizing of masses partially demonstrated mammographically. Later we will discuss the use of ultrasound as a guide for biopsy or cyst aspiration.

Magnetic Resonance Imaging

Ongoing evaluation of contrast-enhanced magnetic resonance imaging (MRI) has shown some utility in diagnosing breast cancer. The examination is useful when a lesion cannot be confirmed by traditional imaging modalities or in the screening of high-risk patients with radiographically dense breasts. MRI may be indicated in the woman with dense breast tissue for staging preoperatively to determine the extent of disease or multicentricity. It is also appropriate for women who have had multiple surgeries, lumpectomy, radiation therapy, silicone implants, and for monitoring response to chemotherapy. MRI may be beneficial in high risk patients with dense breast tissue who have had previous invasive or *in situ* carcinoma in either breast.

Contraindications for breast MRI are in the differential diagnosis of microcalcifications or in evaluating diseases with a high probability of enhancement such as inflammatory change, secretory disease, known dysplasia from previous studies, and fibroadenomas in the younger patient. MRI is not recommended in the first 9 months after therapy.[7,8,9]

Radionuclide Imaging

Several recent studies suggest a new role for radionuclide imaging in the detection of breast cancer. Both ^{201}Thallium scintigraphy and technetium-99m sestamibi (SMM) have been studied and show promise in both detecting malignancy and in differentiating benign from malignant masses. Waxman et al detected 96% of 44 palpable breast cancers with ^{201}Thallium, whereas 19 palpable fibrocystic breast masses were not detected.[10] In a study of 59 patients with mammographic and palpable breast masses, Khalkhali et al demonstrated a 65.8% sensitivity, a 86.8% specificity, a positive predictive value of 82.1%, and a negative predictive value of 97.1% for detecting carcinoma.[11,12] These studies are encouraging and warrant further investigation.

Pneumocystography

Pneumocystography is used to image the interior architecture of an aspirated cyst. It provides a view of all but the dependent wall. After aspiration of the cyst fluid, about half its volume is replaced with room air and mammographic images are obtained in the craniocaudal and 90 degree lateral views. Pneumocystography is also indicated in post menopausal women with a solitary palpable cyst. It should be performed on women who have had a cyst previously aspirated in which the fluid has rapidly reaccumulated. It is also indicated in patients who have bloody cyst aspirates with no history of trauma and in women with a sonogram demonstrating a possible intracystic mass.[13] It should be noted that negative cytology alone does not exclude an intracystic lesion.

Ductography

Ductography, also called galactography or contrast-assisted mammography, is performed to outline the ductal system in the evaluation of patients with nipple discharge, whether clear or bloody. Green, brown, grey, black or straw-colored discharges are less worrisome. Ductography can identify intraductal lesions and is useful in planning surgery for such lesions. Logan-Young notes that although 60% of tumors that produce discharge are within 2 cm of the nipple, the remainder are distally located and without ductography would not have been identified during routine surgery. Such cancers account for about 2% of all nonpalpable malignancies.[14]

The procedure is simple. After identifying the offending duct, and cleansing the areola and nipple, a 27 gauge blunt-tipped, side-holed sialography needle is introduced into the offending duct and contrast-injected. Magnified images are obtained in both craniocaudal and 90 degree lateral views. If filling defects are identified or neoplasm suspected, the duct can be re-opacified preoperatively and either delineated with methylene blue or localized with a hook-wire.

Imaging-Guided Biopsies

The increase in mammographic screening has led to an increase in the number of indeterminate nonpalpable breast masses detected. Imaging guided percutaneous biopsy is a minimally invasive, reliable, nonsurgical technique that allows histologic or cytologic differentiation between benign and malignant disease. It also eliminates the need for short-term interval follow-up and is valuable in reducing patient anxiety in women with radiographically benign breast masses. The procedure has little associated morbidity. There is no surgical deformity or subsequent mammographic distortion. The procedure is performed under local anesthetic. Parker and his associates have demonstrated a 97% histopathologic correlation between specimens obtained with 14-gauge needle gun core biopsies and surgical excisional biopsies.[15]

Needle biopsies may be either fine needle aspiration biopsy (FNAB) or large core (14 gauge) and can be obtained with clinical, stereotactic or sonographic guidance. Stereotactic localization has been used for more than a decade to guide FNAB of the breast.[16] FNAB sensitivities have been reported from 65% to 99%, specificities from 64% to 100% and accuracies from 81% to 98%.[17] Stereotactic devices use the principle of triangulation to calculate precisely the location from which specimens are acquired. Two views of the area in question are obtained at 30 to 40 degrees apart and a computer determines the exact site of needle placement. Such devices are reportedly accurate to within plus or minus 1 mm.

There are two types of stereotactic equipment: the dedicated prone table and the add-on unit for mammography machines. The major advantages of the prone table are improved immobilization of the breast allowing for more accurate localization, easy accommodation of the biopsy gun, and that the patient cannot see the needle thus obviating a vaso-vagal reaction. On the other hand, the advantages of add-on units are that the units are multipurpose and relatively inexpensive.

Stereotactic biopsies are performed under local anesthesia. Masses, microcalcifications and areas of architectural distortion are all amenable to stereotactic biopsy. Images are acquired with the needle in place prior and subsequent to biopsy to verify that the area has been sampled. Digital image acquisition greatly shortens procedure time. Biopsies performed for microcalcifications should have the core samples radiographed to verify that microcalcifications are included in the cores obtained. There are a small number of lesions that are inaccessible to this method because of location, patient's body habitus, or physical limitations.

With the development of the newer generation high-frequency, linear-array ultrasound equipment with improved near-fields, sonographically-guided breast biopsies have become increasingly popular. The method is limited to masses visualized by sonography or to guide biopsies in patients with palpable masses that may not be seen in a mammogram. Sonography cannot be used

to guide the biopsy of microcalcifications. It is useful in the aspiration of sonographically equivocal masses which may be cysts but contain internal echoes and also to aspirate abscesses, postoperative hematomas or lymphoceles. Advantages of ultrasound guidance over stereotactic guidance include the fact that the lesion is visualized in real-time, can be sampled from multiple directions, and shorter distance to target ratio and the rapidity of the procedure.

Preoperative Needle Localization

Preoperative needle localization is performed to ensure that a nonpalpable lesion is excised with only a minimum of normal breast tissue. In 1966 Berger et al[18] described a method for localizing nonpalpable areas with the placement of cutaneous lead markers and extrapolating the localization of the lesion onto a diagram of the breast. Preoperative localization with a hook-wire, described by Frank et al in 1976,[19] is currently the most common method to localize suspicious nonpalpable lesions.

A variety of devices and imaging modalities have been used. Needles, contrast installation, a variety of hook-wires and, in Europe, even carbon, have been used. Traditionally such localizations have been performed with mammographic guidance but with newer sonographic equipment hook wires can be place quickly and efficiently under sonography as well. A number of devices are under investigation to allow localization of lesions detected with MRI but occult to other imaging modalities.

Summary

Over the past 25 years the radiologist's role in the diagnosis of breast cancer has expanded from merely confirming the clinical suspicion of neoplasm to detecting occult nonpalpable tumors and now percutaneously obtaining tissue for histologic assessment. The cancer the radiologists discover is smaller in size and earlier in stage, allowing more conservative surgical approaches. This, coupled with adjuvant radiation therapy and chemotherapy, is producing newly demonstrated mortality reduction in this disease so feared by American women.

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Management of *In Situ* Carcinoma of the Breast: Lobular and Ductal Origin

Russell E. White, MD, MPH, and Kirby I. Bland, MD, FACS

Understanding the pathology, epidemiology, and natural history of these lesions allows one to formulate diagnostic and therapeutic strategies.

Recent advances in the management of breast cancer have led to significant reduction in mortality. Heightened public awareness and the widespread use of screening mammography has led to the discovery of breast lesions at much earlier stages. The earliest recognized malignant lesion is carcinoma *in situ* occurring in two forms: Lobular carcinoma *in situ* (LCIS), which arises from the terminal breast lobules, and ductal carcinoma *in situ* (DCIS), which arises from the ductal epithelium and is the noninvasive form of ductal breast carcinoma. Only during the past 20 years has significant attention been given to these early lesions, which now account for a large proportion of patients with breast cancer. Understanding the pathology, epidemiology, and natural history of these lesions allows one to formulate diagnostic and therapeutic strategies.

Pathology

The pathognomonic feature of *in situ* carcinoma is the lack of invasion of cancer cells beyond the basement membrane. This diagnosis is therefore made with light microscopy of pathologic specimens.

Lobular Carcinoma In Situ: Lobular carcinoma *in situ* (LCIS) develops from the inner cuboidal cell layer of the terminal lobules of the breast.[1] The cells themselves have characteristics typical of malignancy including loss of cohesion, cellular enlargement, and cellular proliferation and crowding which may fill and distend the lobular lumen (Figure 1). Unique to LCIS is the absence of mitoses and necrosis and the presence of microcalcification not in the abnormal area of LCIS, but rather in the surrounding benign tissue.[2] This pattern has been called "neighborhood calcification."

The incidence of multicentricity (presence of other foci within the ipsilateral breast) and bilaterality (presence of other foci within the contralateral breast) approaches 100% if an extensive search is made throughout all breast tissue. For this reason, LCIS should be assumed to be present throughout all breast quadrants whenever it is confirmed in a biopsy specimen.[2,3] Estrogen receptors are usually present in LCIS, and nuclear grades and proliferative rates are generally low.[4] These factors all are consistent with the relatively benign biologic behavior of LCIS.

Ductal Carcinoma *In Situ*: Ductal carcinoma *in situ* (DCIS) consists of four histopathological variants that likely represent successive stages of progression to invasive carcinoma. The *papillary* type may be difficult to distinguish from benign hyperplasia and consists of cellular proliferation of the inner cuboidal epithelial cell layer of the lactiferous ducts. The individual cells are quite benign in appearance with notable absence of mitoses or atypical characteristics. This pattern may progress to the point where the ductal lumina become nearly obstructed, with only occasional spaces between sheets of more pleomorphic cells. This histological finding is known as the *cribriform* pattern. The ducts eventually become completely filled and distended with more anaplastic cells with significant numbers of mitotic figures characterizing the solid pattern of DCIS. Finally, the cellular burden outstrips its blood supply and necrosis occurs within the ducts. Microcalcification also usually occurs in these areas, giving the typical mammographic pattern of the *comedo* pattern of DCIS (Figure 2).

Multicentricity occurs in approximately 30% of cases of DCIS,[5,6] and bilaterality occurs in 10% to 15% of cases,[5,7] which is in sharp contrast to LCIS. As in the case of LCIS, absence of invasion beyond the basement membrane is a prerequisite for the diagnosis of DCIS.

ABBREVIATIONS USED
DCIS: Ductal carcinoma in situ
DNA: Deoxyribonucleic acid
FNAB: Fine needle aspiration biopsy
LCIS: Lobular carcinoma in situ

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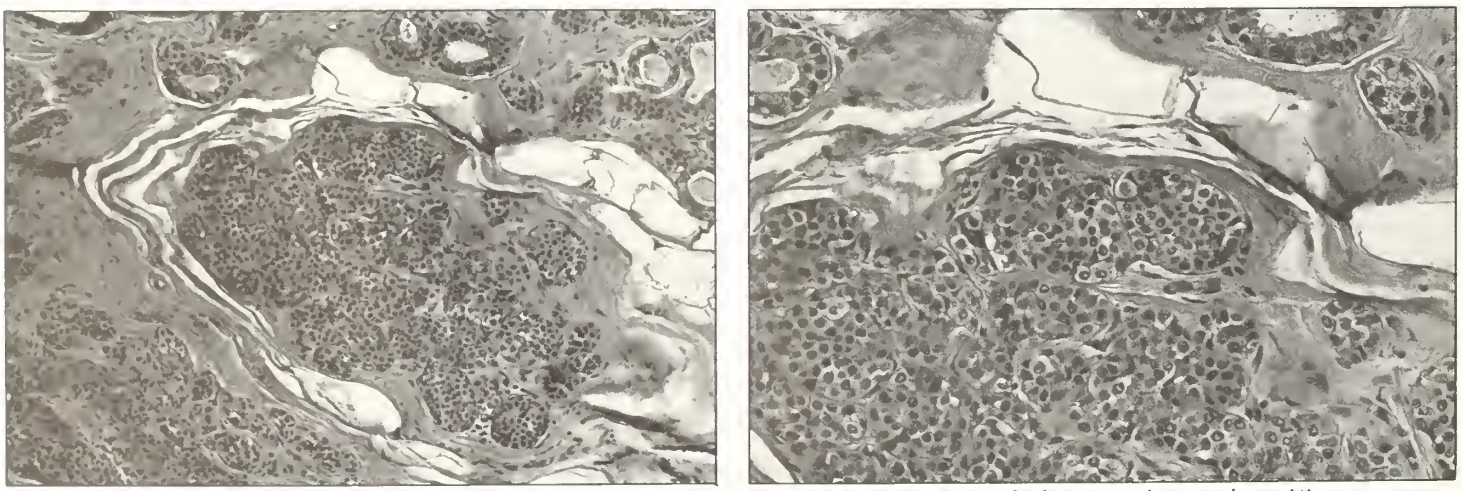

Fig 1.—Lobular carcinoma *in situ*. While cells are typical of malignancy, there is an absence of mitoses and necrosis and the presence of microcalcification in surrounding tissues.

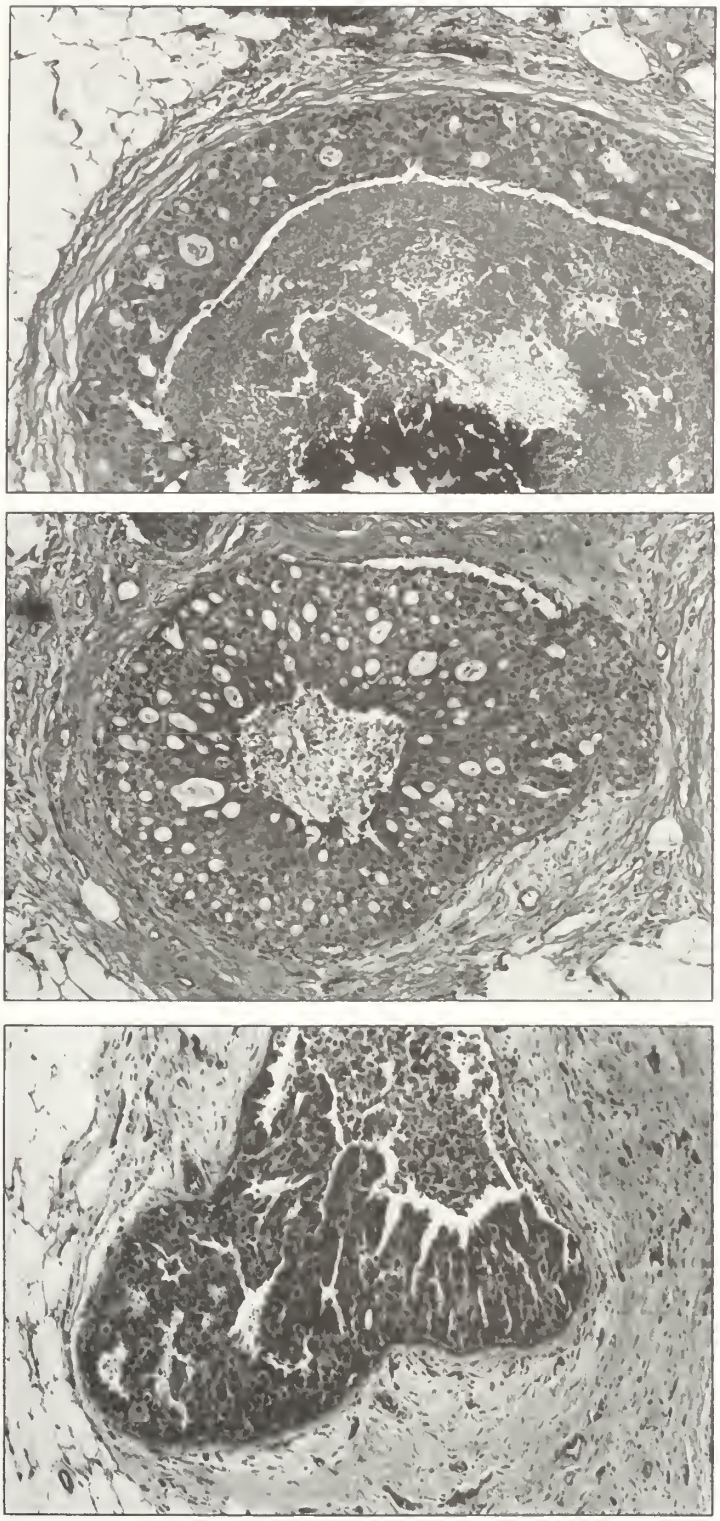

Fig 2.—Ductal carcinoma *in situ*.

Epidemiology

In previous years, *in situ* carcinoma of the breast was a rare finding with an incidence of only 1.4% in all breast biopsy specimens, accounting for only 3% to 6% of all breast cancers.[8,9] Further, LCIS was three times more common than DCIS during this time. With the advent of widespread screening mammography, the incidence of *in situ* breast carcinoma is increasingly diagnosed. Currently, *in situ* carcinoma is present in 9.6% of all breast biopsy specimens and accounts for 45% of all breast carcinomas.[5] Further, there has been a significant shift in the distribution of *in situ* carcinoma with DCIS now six times more common than LCIS.[10,11]

Lobular Carcinoma *In Situ:* Lobular carcinoma *in situ* is found as an incidental finding on breast biopsy since there is no clinical or radiologic manifestation of the disease. This condition occurs only in women. The average age of occurrence is 44 to 47 years, with up to 90% of women premenopausal at diagnosis. This is in contrast to the clinical presentation of invasive breast carcinoma, in which only 30% are premenopausal.[2,11] LCIS occurs 12 times more frequently in white women than black women. Whether this is due to genetic differences or differences in access to health care is unclear. LCIS is present in 2.2% of all breast biopsies and accounts for 9.8% of all breast cancers.

Ductal Carcinoma *In Situ*: The average age for diagnosis of ductal carcinoma *in situ* is 55 years, which is consistent with the average age of incidence of invasive breast cancer, indicating the premalignant nature of DCIS and its relation to invasive cancer. This condition occurs primarily in women, but also accounts for 5% of all male breast carcinomas.[12] DCIS now is present in 7% of all breast biopsies and accounts for 30% of all breast cancers.[5] The emergence of DCIS as the predominant variant of *in situ* carcinoma is most likely associated with its characteristic appearance on mammogram, which LCIS does not have.

Natural History

During the past decades, *in situ* carcinoma of the breast was treated as a single entity without regard for histologic subtypes; mastectomy was the preferred therapy. It is quite clear, however that LCIS and DCIS are distinct entities with very different presentations and clinical courses (Table 1).

Lobular Carcinoma *In Situ*: Lobular carcinoma *in situ* is generally accepted to be a marker of risk for the development of invasive breast cancer, rather than a true precursor of an invasive lesion. Several findings support this conclusion. About 10% to 37% of all women with LCIS will eventually develop invasive breast carcinoma. This implies a risk 12 times greater than the general female population in the United States. When invasive breast cancer does develop, it usually occurs more than 15 years after the discovery of LCIS.[2,13] Further, it may occur in either breast, regardless of where the original lesion was discovered, and up to 65% of these invasive lesions will be ductal in origin.[2,14,15] Synchronous invasive breast cancer is discovered in 5% of patients at the time of diagnosis of LCIS.[13,16]

Lobular carcinoma *in situ* should therefore be considered a risk factor for subsequent development of invasive breast cancer. In this regard, it should be considered in the same category with atypical hyperplasia, history of contralateral breast cancer, and family history of breast cancer.

Ductal Carcinoma *In Situ:* Ductal carcinoma *in situ* represents a true precursor of invasive breast carcinoma. Following a breast biopsy which reveals DCIS, there is a 30% to 50% chance of development of subsequent invasive breast cancer. In contrast to LCIS, nearly all of these cancers develop within 5 to 10 years of diagnosis of DCIS. Further, these invasive lesions are predominantly of ductal origin and develop within the same quadrant of the ipsilateral breast that originally harbored DCIS. This condition tends to be multifocal within the breast quadrant with a 77% incidence of residual DCIS found within the original biopsy site.[17,18]

The natural history of ductal carcinoma *in situ* depends largely upon the size and histologic pattern of the specific lesion. Larger, more histologically aggressive, lesions tend to have a significantly increased frequency of microinvasion, multicentricity, axillary lymph node metastases, local recurrence, and poorer overall survival. Unfortunately, the more aggressive histopathologic comedo pattern of DCIS tends to dominate in biopsy specimens.

Table 1.—Salient characteristics of *in situ* ductal and lobular carcinoma of the breast

Parameter	LCIS	DCIS
Age (yr)	44–47	54–58
Incidence *	2%–5%	5%–10%
Clinical signs	None	Mass, pain, nipple discharge
Mammographic signs	None	Microcalcifications
Premenopausal	2/3	1/3
Incidence synchronous invasive carcinoma	5%	2%–46%
Multicentricity	60%–90%	40%–80%
Bilaterality	50%–70%	10%–20%
Axillary metastasis	1%	1%–2%
Subsequent carcinomas		
Incidence	25%–35%	25%–70%
Laterality	Bilateral	Ipsilateral
Interval to diagnosis	15–20 years	5–10 years
Histologic type	Ductal	Ductal

* Among biopsy specimens of mammographically detected breast lesions.
From Frykberg ER, Ames FC, Bland KI. Current concepts for management of early (*in situ* and occult invasive) breast carcinoma. In Bland KI, Copeland EM, eds. *The Breast.* Philadelphia: WB Saunders; 1991:736. Used by permission.

Diagnosis

As previously stated, the diagnosis of lobular carcinoma *in situ* is established as an incidental finding in most cases since there is no clinical or radiographic manifestation of the disease. In these situations, LCIS is discovered in a biopsy specimen outside the abnormal area. It should be noted, however, that benign hyperplasia may be very difficult to differentiate from *in situ* carcinoma. Therefore, the finding of hyperplasia should alert the experienced pathologist to extensively evaluate the specimen to rule out *in situ* carcinoma.

Ductal carcinoma *in situ* may present either as a palpable mass or a mammographic abnormality. Clustered microcalcifications on mammogram will reveal a carcinoma in 34% of cases, with 90% of these lesions being *in situ*.[6,19] Further, interval change on mammography is associated with an 18% risk of malignancy. Again, most of these lesions are histologically *in situ*.[20]

Biopsy of all palpable breast lesions and all suspicious lesions on mammogram should be performed. While fine needle aspiration biopsy (FNAB) is effective in confirming malignancy, it cannot differentiate invasive carcinoma from *in situ* carcinoma. Therefore, open biopsy should be completed to establish the diagnosis of *in situ* carcinoma. Currently, needle localization with open biopsy is the most accurate method for diagnosis of *in situ* carcinoma with lesions found on mammogram.

Treatment

Lobular Carcinoma *In Situ*: Historically, unilateral mastectomy was the most common treatment for lobular carcinoma *in situ*. However, when one understands the natural history of LCIS, it is clear that this is an ineffective and likely unnecessary therapy. Currently, there are really only two viable alternatives in the treatment of this condition: nonoperative observation with lifelong surveillance is the course which is recommended by North American and Western European clinics for most women with LCIS. Understanding that invasive breast cancers may develop in these patients well in excess of 15 years, this is a quite reasonable clinical option. One must understand that this course is not without risk given the fact that there is a 7% mortality rate from breast cancer in patients committed to observational surveillance.

As previously stated, LCIS should be considered a risk factor for subsequent development of invasive cancer. Therefore, if a patient has multiple other risk factors for breast cancer (eg, strong family history of premenopausal cancer, young age, noncompliance, etc.), surgery should be considered as the second option for management. In these situations, bilateral, total mastectomy effectively removes the risk of subsequent invasive carcinoma. Given the bilaterality and multifocality of the condition, lesser operations are not warranted after the diagnosis has been established by biopsy. Further, given the very low incidence of axillary involvement (<1%), axillary dissection is not indicated.[2,11,16] Since the disease is assumed to be present throughout the breast, simple reexcision of a previous biopsy site to obtain clear margins is unfounded and contraindicated. Likewise, mirror image biopsy of the contralateral breast which has been advocated for LCIS in the past is not warranted. With advances in breast reconstruction techniques, and the availability of immediate reconstruction, the significant emotional and social morbidity of bilateral mastectomy is lessened. No benefit has been demonstrated with the use of radiation therapy or systemic cytotoxic chemotherapy. Clinical trials are currently ongoing to evaluate the use of the anti-estrogen drug tamoxifen in the treatment of LCIS.

The patient with LCIS should clearly understand the natural history of the disease. With a frank discussion of risk factors and risk of subsequent development of invasive breast cancer, the patient and physician can together best decide between the two alternatives of nonoperative observation with lifelong surveillance or bilateral total mastectomy.

Ductal Carcinoma *In Situ*: Mastectomy has been the standard treatment for DCIS for several decades, and is therefore the standard against which all other forms of therapy must be compared. Local recurrence following mastectomy for DCIS occurs at a rate of 0.75%, with an overall cancer-related mortality of 1.7%.[5] Recently, breast-conserving operations have been performed for DCIS. Local recurrence following wide local excision alone for DCIS has ranged from 10% to 63%, with 25% to 100% of these recurrences being invasive cancer. The addition of breast irradiation following wide local excision for DCIS has reduced local recurrence rates to 5.5% to 25%.[21] In a randomized, prospective comparison of these treatment modalities, the addition of postoperative radiation reduced the incidence of local breast recurrence from 16% to 7%.[22]

Table 2. Factors favoring the treatment of DCIS with mastectomy

Patient preference
Comedo histology, especially high histological grade
Palpable or large tumor (> 2 cm)
Lumpectomy with margins involved by tumor
Extensive multicentricity
Multiple mammographic/ultrasound abnormalities
Local breast recurrence following breast-sparing therapy
(?) Young age
(?) Aneuploid DNA pattern (high S-phase-flow cytometry)
(?) Oncogene overexpression

Modified from Frykberg ER, Bland KI. *World Journal of Surgery* 1994; 18: 45-57.

While these figures support the addition of radiation therapy to wide local excision for locoregional control, the recurrence rate and actuarial survival following breast-conserving therapy continues to be less desirable than that following mastectomy for DCIS.[23] To date, no randomized, controlled, prospective trials comparing wide local excision with radiation and mastectomy has been performed for the treatment of DCIS.

It is clear from these studies that several factors make recurrence following wide local excision more probable (Table 2). These include large size and specific histochemical characteristics of the tumor. To determine the appropriate therapy for a specific patient with DCIS, the physician and patient must carefully consider and discuss the risk factors for subsequent development of recurrence, either *in situ* or invasive, listed in Table 2. The patient with DCIS must understand that the treatment with the lowest recurrence rate and disease-associated mortality continues to be mastectomy. This finding may be somewhat difficult to comprehend, given the recent evidence that many invasive cancers can be treated effectively with breast-conservation.[24,25] However, these disease processes may not be entirely comparable. Data from Solin, Fowble and associates of the University of Pennsylvania suggest enhanced disease-free survival with breast irradiation following conservative therapy of DCIS of comedo-type with high nuclear grade.[26]

After considering the risks and benefits, patients with favorable lesions should be offered breast conservation with wide local excision with or without irradiation of the intact breast. If histologically negative margins cannot be obtained, mastectomy should be performed. In either case, axillary lymph node dissection in general is *not* indicated, given the low incidence of axillary nodal involvement of 1% to 2%.[27] Systemic cytotoxic chemotherapy or hormonal therapy has not yet been shown to be efficacious in this disease and should not be offered outside the research protocol setting.

Patients treated with breast-conservation for DCIS must be followed carefully. A mammogram should be obtained within 6 months of surgery to serve as a baseline for future comparison. Following this baseline study, mammography should be performed on an annual basis. Physical examination should be performed every 3 to 6 months during the first 5 years of follow-up, since during this interval the risk of recurrence is greatest. After this 5-year period, physical examination should be performed on an annual basis. Although the most appropriate therapy for recurrent disease following breast-conserving surgery for DCIS is not clearly established, reexcision may be considered. With diagnosis of recurrent lesions, the surgeon must exercise similar therapy management guidelines and principles essential to treatment of the primary lesion.

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Breast Conservation Therapy in the Management Of Invasive and *In Situ* Carcinoma

Gabriela B. Masko, MD, Scott A. Triedman, MD, Roger L. Brotman, MD, Banice M. Webber, MD, Anthony Yu, MD

The goal of breast conservation in the treatment of early breast cancer is to provide a good cosmetic result without compromising local control or survival.

Carcinoma of the breast is the most commonly diagnosed malignancy in women in the United States. In Rhode Island, 825 women were diagnosed with breast cancer in 1991 and 233 women died of the disease that year. [1]

Over the last two decades, the incidence of breast cancer has been increasing, most likely as a result of better screening practices. In fact, the number of women diagnosed with small tumors has increased dramatically. In Rhode Island, the proportion of in situ or localized breast cancer increased by 14% between 1987 and 1991. This has led to a greater interest in breast conservation in both the medical community and our patients, who are increasingly informed about available treatment options.

The European and Canadian experience with breast conservation since the 1930s, and the published results of this experience from the Institut Curie and Princess Margaret Hospital, stimulated the study of new approaches to the treatment of breast cancer in this country. The traditional concept that more extensive surgery yields a more favorable outcome has certainly been challenged.

Invasive Cancer

> "Breast-conservation treatment is an appropriate method of primary therapy for the majority of women with Stage I and II breast cancer and is preferable because it provides survival equivalent to total mastectomy and axillary dissection while preserving the breast."
>
> *NIH Consensus Statement, 1992*[2]

This statement represents many years of clinical trials, both national and international, that have paved the way for what is now known as the conservative treatment of breast cancer. In 1979, thirteen years prior to this conclusion, the National Institutes of Health (NIH) sponsored a consensus development conference to discuss the clinical alternatives to radical mastectomy. The outcome of this conference was the recommendation that total mastectomy with axillary dissection replace the Halsted radical mastectomy as the treatment standard, and it encouraged vigorous study of procedures aimed at breast conservation.[3]

The National Surgical Adjuvant Breast and Bowel Project (NSABP) initiated its B-04 trial in 1971. This was a randomized trial that assigned 1700 women to radical mastectomy, total mastectomy and local-regional radiation, or total mastectomy without radiation or axillary node dissection. (Node dissection was performed if nodes subsequently became clinically positive.) Results at 15 year follow-up failed to demonstrate any significant difference in overall treatment failure, frequency of distant metastases or survival.[4] With little evidence to support traditional Halstedian principles of breast tumor management, the obstacles to exploring breast conservation were essentially removed.

The NSABP B-06 trial opened in 1976 with the aim of evaluating breast preservation. Patients with T1, T2, N0, N1, M0 breast tumors were randomized to one of the following groups: total mastectomy, lumpectomy, or lumpectomy followed by breast irradiation. The lumpectomy was performed to insure that the surgical margins were tumor-free; all women had an axillary dissection and those with positive nodes were also treated with chemotherapy. The published results in 1985 demonstrated that for 1843 women entered in the trial, treatment by lumpectomy, with or without breast radiation, resulted in disease-free survival, distant disease-free survival, or overall survival that was no worse than that achieved after total mastectomy. A total of 92.3% of women treated with radiation remained disease-free compared with 72.1% of those receiving no radiation ($p < 0.001$).[5] The most recent update from NSABP B-06 in 1992 reiterated that lumpectomy followed by breast radiation in all patients (and adjuvant chemotherapy in women with positive nodes), is appropriate therapy for T1, T2, N0, N1, M0 tumors resected with negative margins.[6]

Despite the scientific literature noted above and the ever-increasing favorable international data, conservative treatment of breast cancer has not been widely adopted by the surgical community. Although breast conservation therapy (BCT) is largely accepted in New England, there remain many regions in this country where mastectomy is still the treatment of choice for early breast cancer. Possible explanations for the regional differences include lack of patient counseling, physician bias and limited access to radiation therapy, especially in rural communities.

In Situ Carcinoma

Since the advent of high quality mammography, ductal carcinoma in situ (DCIS) is diagnosed more frequently. Lesions may be found incidentally or may be identified as palpable or mammographic abnormalities. The most common mammographic finding associated with DCIS is clustered microcalcifications: these calcifications may be rounded or linear, and branching or nonbranching. The presence of more than five calcifications within a cubic centimeter of tissue should be regarded as suspicious.[7]

The pathologic features of DCIS are heterogeneous and exhibit a variety of histologic patterns. DCIS is generally classified into five subtypes based on microscopic features: comedo, cribriform, micropapillary, papillary and solid types. The findings

ABBREVIATIONS USED

BCT: Breast conservation therapy
CGy: Centigray (radiation measurement unit)
CVD: Collagen vascular disease
***DCIS: Ductal carcinoma* in situ**
DNA: Deoxyribonucleic acid
EIC: Extensive intraductal component
EORTC: European Organization for Research and Treatment of Cancer
ERBB2: Designation for an oncogene
NIH: National Institutes of Health
NSABP: National Surgical Adjuvant Breast & Bowel Project
RT: Radiation therapy

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of comedo-type necrosis and high grade are thought to be associated with increased local recurrence. Usually, when no evidence of invasion can be seen on light microscopy, the incidence of axillary node metastases in patients with DCIS is 0-1%.[8] With large lesions (>5 cm) there may be an increased risk of occult invasion or nodal metastasis.

Management of DCIS remains controversial. Before 1980, intraductal cancer was generally treated with total mastectomy, and retrospective series report distant or local recurrence rates of 1-2%.[9] Given the success of BCT in patients with invasive breast cancer, there has been substantial interest in defining which DCIS patients are appropriate for breast preservation. Until recently, most studies were retrospective and looked at wide excision alone versus wide excision plus RT. The results suggested improved local control in patients treated with RT following wide excision. (However, the length of follow-up and numbers of patients were limited, and significant surgico-pathologic and radiographic variables were not controlled.)

In 1985, the NSABP initiated a randomized trial of lumpectomy versus lumpectomy and RT for the treatment of DCIS (NSABP B-17): 818 women with localized DCIS and tumor-free margins were randomly assigned to undergo lumpectomy alone or lumpectomy followed by 5000 cGy breast radiation. Results were published with a mean follow-up of 43 months: 5-year event-free survival was improved in patients who received breast radiation (84.4% versus 73.8%, p= 0.001). The improvement was due to a reduction in second ipsilateral breast cancers. The five year cumulative incidence of second cancers in the ipsilateral breast was reduced by radiation from 10.4% to 7.5% for non-invasive cancers, and from 10.5% to 2.9% for invasive cancers (p= 0.055 and p< 0.001, respectively). The conclusion was that breast radiation after lumpectomy is more appropriate than lumpectomy alone for women with localized DCIS.[10]

At this time, BCT remains a reasonable alternative to mastectomy in patients with localized, completely resected DCIS. Although RT following complete excision appears to reduce breast recurrences, there may be a subset of patients with small (< 1 cm), histologically favorable DCIS that can be adequately treated with excision alone.

Selection

The goal of breast conservation in the treatment of early breast cancer is to provide a good cosmetic result without compromising local control or survival. The initial multidisciplinary evaluation of the patient is critical in assessing the appropriateness of conservative surgery and radiation, and the sequencing of systemic therapies. Ideally, the radiation oncologist should evaluate the patient following the initial diagnosis to determine if the patient is a candidate for RT before definitive surgery has been performed. Candidates for BCT are those with a discrete mass measuring less than four to five centimeters, without diffuse microcalcifications and no prior history of collagen vascular disease. Young age at diagnosis is not a contraindication to conservative therapy. Patients with involved axillary nodes do not have a higher risk of breast recurrence when treated with conservative surgery and radiation.

Table 1 lists the major issues in selecting patients for breast conservation. The most important consideration is the ability to adequately resect all tumor with adequate margins while preserving an acceptable cosmetic result. Therefore, a large tumor in a small breast, or multicentric disease would defeat this goal. The finding of multicentricity may also adversely affect the local control of the tumor and, in general, these patients are best treated with mastectomy. On occasion, two separate but adjacent lesions can be acceptably treated with wide excision and RT.

Patients with pre-existing collagen vascular disease (CVD) may have substantially increased risk of complications such as necrosis and fibrosis of soft tissues when treated with RT. The University of Texas MD Anderson Cancer Center reported four patients with pre-existing CVD whose breasts were radiated: three suffered severe complications (ie, chest wall necrosis, brachial plexopathy) and the fourth died five months after treatment (not allowing sufficient time to develop late complications).[11] Such reports emphasize the importance of early evaluation by a radiation oncologist to determine the suitability of a patient for RT.

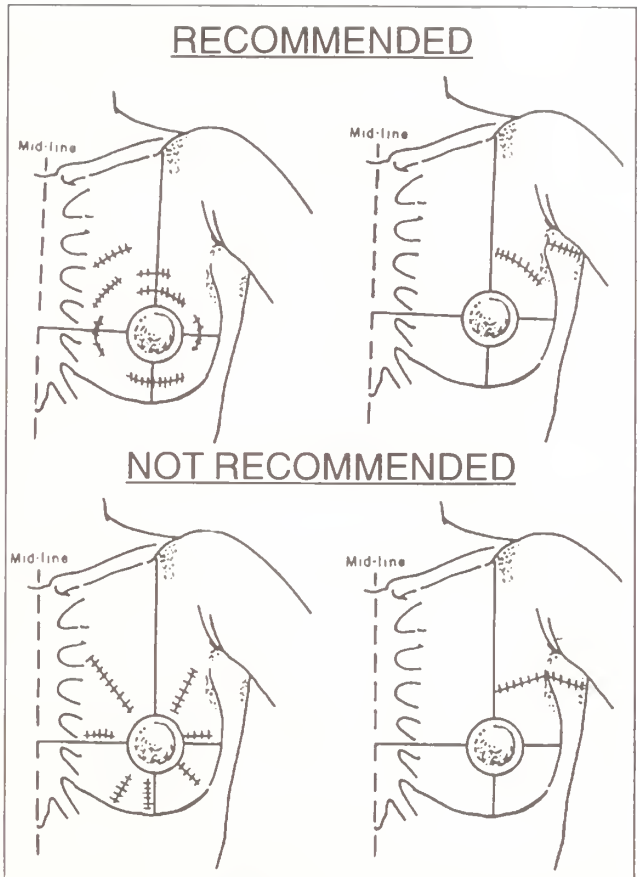

Fig 1.—Recommended and non-recommended incisions. (From Fisher B, Wolmark N. Lumpectomy and axillary dissection for breast cancer: Surgical, pathological, and radiation considerations. *World J Surg.* 1985;9:693–698, with permission.)

Radiographic Considerations

According to statistics from the Rhode Island Department of Health, the use of screening mammography in the state of Rhode Island increased 105% between 1987 and 1991. This is consistent with the national effort to better educate patients and physicians regarding the benefits of screening mammography. This has resulted in an increase of 14% in the diagnosis of in situ or localized tumors during the same time period.[1] Recently the National Cancer Institute reported a dramatic decline in breast cancer deaths during its National Cancer Advisory Board meeting. This is certainly in part related to the earlier detection of breast cancers through screening mammography.

Bilateral mammography is an integral part of the evaluation of a patient for BCT. It helps to define the extent of the tumor, determine if multicentricity is present, and also evaluates the contralateral breast for a synchronous primary tumor. A bilateral mammogram should be obtained in patients with palpable as well as non-palpable lesions. In patients with abnormal microcalcifications, a post-biopsy mammogram is recommended in order to rule out the presence of residual microcalcifications.

With non-palpable lesions, needle localization is necessary and a specimen radiograph is essential to confirm the presence of the abnormality within the specimen.

Following BCT, follow-up mammogra-

phy is necessary to determine early recurrence in the treated breast as well as to monitor the development of a contralateral breast cancer. A mammogram of the treated breast is obtained six months after completion of RT to establish a new baseline. It must be understood that postoperative and post-radiation changes such as scarring, edema, skin thickening and calcifications are common and make the interpretation of the mammogram more difficult. Six to twelve months after treatment, these mammographic findings should gradually resolve, and stabilize within 2 years.

Surgical Considerations

Since local excision has become accepted treatment for invasive breast carcinoma, there has been a change in the concept of what surgery is appropriate. It was originally thought that total gross excision of the malignant tumor was sufficient. No attempt was made to evaluate the adequacy of the excision margins microscopically, and little or no attention was paid to the presence or absence of concomitant DCIS. Over the past 10 to 15 years, more attention has been paid to these factors, and as a result the type and extent of surgery have changed. An effort is now made to carefully evaluate the margins, and if there is evidence of microscopic tumor involvement, re-excision of breast tissue has become the standard treatment. While this has contributed to a reduction in local recurrence rate from 10 to 20% to less than 5%, it has also, in many cases, resulted in poor cosmesis. In addition, there has been an increasing tendency to extend the axillary dissection from a nodal "sampling" of levels I and II to a full axillary dissection. This more extensive surgery in the axilla may result in poor cosmesis and function because of resulting arm edema and limited shoulder motion.

The lumpectomy should be looked upon as a cosmetic operation which will leave the patient with a breast which should be indistinguishable from the opposite side. Excessive re-excisions result in gross deformity of the breast, often with marked elevation of the nipple and reduction of breast size as compared to the unoperated side. Long transverse supra-areolar incisions are apt to result in very poor cosmetic results since they can produce interference with lymphatic drainage from the inferior portions of the breast. These incisions, especially when associated with extensive axillary dissections, usually result in chronic lymphedema of the inferior portion of the breast. This is associated with peau d'orange changes in the skin, and fibrosis which may be exacerbated by the necessary radiation which follows this surgery. Care must be taken in the placement of incisions. Radial rather than transverse incisions should be used (Figure 1). The breast excision and the axillary dissection should be accomplished through separate incisions.

Table 1.—Selection of Patients for Treatment with Conservative Surgery and Radiation

Major Factors:
Patient choice
Pregnancy
Medical condition (ie, Collagen Vascular Diseases)
Tumor size in relation to breast size
Multifocal/ multicentric disease
Resection margins
Histologic features (ie, extensive intraductal component)
Minor Factors:
Age
Tumor location (ie, retro-areolar)

Certain factors which in the past had been considered contraindications to breast conservation no longer apply. Tumors arising in the retro-areolar area can be managed by lumpectomy and radiation if the patient is willing to sacrifice the nipple-areolar complex. When asked, many women prefer this to the loss of the entire breast.

Every effort should be made to achieve excellent hemostasis during surgery and to try to avoid lymphatic leaks in the axilla. Postoperative hematomas and axillary seromas delay the onset of post operative radiation and contribute to arm edema and areas of induration which can persist for long periods of time. Such areas are often a source of continuing concern to the patient and her physicians since they can mimic recurrent tumor.

The insertion of a metallic clip in the depths of the tumor bed should be part of every local excision. It allows the radiation oncologist to localize the area with accuracy, and aids greatly in calculating the appropriate beam energy when the tumor bed receives additional radiation (a "boost") after the entire breast has been treated.

Current thinking holds that many patients, especially the elderly with small invasive carcinomas, can be spared axillary dissection, with its accompanying potential for increased morbidity. There is evidence that axillary recurrence in these patients is a rare occurrence and that the axilla can be well managed by including it in the radiation plan.[12]

Pathologic Considerations

Extensive investigation has been done to attempt to identify pathologic prognostic factors predicting outcome in BCT. The following information relates only to local control rate, since this is the only rational endpoint when assessing local measures such as surgery and RT.

When one considers histology, BCT appears to be appropriate for all histological variants of epithelial breast cancer (in patients who satisfy the previously described selection criteria). Over 70% of cases are infiltrating duct cell carcinomas. Other histologies, in decreasing order of incidence, are: infiltrating lobular carcinoma, medullary carcinoma, tubular carcinoma, mucinous carcinoma and colloid carcinoma. The tubular, mucinous and colloid variants are thought to have a better overall prognosis (due mainly to a lesser propensity to metastasize) but no data exist regarding any local control differences. The data are even harder to interpret for in-situ disease. Excellent local control rates have been reported for all subtypes of DCIS, but the comedo subtype is felt to express the highest potential for multifocality and microinvasion. Lobular carcinomas in-situ appear to represent "marker" lesions for increased risk of invasive cancer in either breast, rather than intrinsically premalignant lesions and do not require additional treatment with surgery and/or RT. Nevertheless, because of the elevated risk of developing breast cancer, very close follow-up is essential.

A host of other pathological, biochemical and immunocytochemical parameters are available for analysis. These include tumor grade, vascular space invasion, estrogen/progesterone receptor status, DNA ploidy, S-phase fraction, cathepsin-D level, epidermal growth factor receptor, and oncogene amplification (eg, ERBB2). To date, no conclusive data exist to support the association of local control probability to any of these factors.

The only known pathologic criteria which seem to correlate with local control probability are the adequacy of the surgical margin of resection, and the presence of an extensive intraductal component (EIC). Veronesi reported a trial of 705 cases of invasive breast cancer randomized to have full quadrantectomy plus radiation versus "tumorectomy" plus radiation.[13] All patients received the same radiation dosage (4500 to 5000 cGy to the entire breast, followed by 1000 to 1500 cGy boost to the tumor bed). The quadrantectomy patients had a 2.2% local recurrence rate versus 7% for the "tumorectomy" cases. Unfortunately, the quadrantectomy patients traded cosmesis for an improved local control rate. Schmidt-Ullrich et al have improved both local control and cosmesis with a program of meticulous evaluation of surgical margin followed by an escalating dose schedule based on the extent of the margin (negative: 6000

cGy, close: 6500 cGy, positive: 7000 cGy).[14] In their hands, even patients with microscopically involved margins had an excellent local control rate when appropriate boost doses were given (no local recurrences at 60 months).

The presence of EIC as a predictor of local failure was first identified at the Joint Center for Radiation Therapy.[15] EIC was defined as the presence of at least 25% DCIS within the measured tumor borders, as well as in grossly normal appearing adjacent breast tissue. Local recurrence occurred in 27% of EIC-positive tumors, but only 8% of EIC-negative tumors. The impact of EIC on local recurrence was felt to diminish as the extent of the surgical resection increased.

Radiotherapeutic Considerations

Following adequate surgical excision and axillary dissection (if indicated), external beam radiation is directed to the entire breast. Simulation or treatment planning is first performed on a specially designed X-ray machine to determine the size, location and angles of the tangential radiation portals. A total dose of 4500 to 5000 cGy is delivered over a period of five weeks using megavoltage radiation therapy equipment (4 to 6 MV). This is often followed by a boost dose to the tumor bed of 1000 to 1400 cGy. In patients with negative margins, the use of a routine boost remains controversial. The European Organization for Research and Treatment of Cancer (EORTC) is currently investigating this issue.

Sequencing of radiation therapy and chemotherapy in patients for whom chemotherapy is recommended is not clearly defined. Although some centers utilize concurrent chemotherapy and radiation therapy, this usually requires the omission of methotrexate or doxorubicin during radiation therapy. In addition, experience from the Joint Center for Radiation Therapy using concurrent radiation therapy and chemotherapy has described a significantly worsened cosmetic result.[16] Most radiation therapy centers either deliver the chemotherapy before or after the radiation, or use "sandwich technique", which delivers half of the chemotherapy followed by radiation, and then completion of chemotherapy. The optimal sequencing of chemotherapy and radiation is still being studied.

Patients who have four or more histologically positive axillary lymph nodes usually receive radiation therapy to the supraclavicular and apical axillary nodes delivering a dose of 4500 to 5000 cGy over 5 weeks.

Most patients are very satisfied with the cosmetic outcome following BCT. Common acute side-effects of radiation therapy to the breast include erythema and edema of the breast. Within 2 to 3 weeks after completion of therapy, the acute reaction usually subsides. Arm edema, persistent breast edema, breast fibrosis, radiation pneumonitis, pericarditis, brachial plexopathy and rib fractures are complications which rarely occur. The incidence of radiation-induced second malignancy is less than 1%.[17] There is no conclusive scientific evidence that breast radiation increases the risk of contralateral breast cancer.

Follow-up

A small percentage of patients will develop local recurrence after BCT and many are successfully treated with total mastectomy. Hence, long-term follow-up with physical examination and mammography is essential for early detection of local recurrence.

The American College of Radiology and the American College of Surgery have recommended the following standards for follow-up of patients treated with breast conservation:[18]

1. History and physical examination every three to six months for years one to three, then every six months for years four and five, and annually thereafter.
2. Post-radiation mammogram at six month intervals during the first year and annually thereafter, or more frequently if warranted by clinical or radiographic findings.
3. Annual mammography of the contralateral breast or at more frequent intervals as warranted.

There has been no demonstrated survival benefit to the routine metastatic screening of asymptomatic patients.

Future Directions

At this time, there continues to be active clinical research aimed at refining current management of early breast cancer. Ongoing national protocols, such as NSABP B-24, are evaluating the worth of tamoxifen in conjunction with lumpectomy and breast radiation for the treatment of DCIS. In CALGB 9343, elderly patients with early stage, completely resected breast cancers are being randomized to lumpectomy, radiation therapy and tamoxifen, versus lumpectomy and tamoxifen. In numerous other ongoing clinical protocols, the optimal adjuvant chemo-endocrine therapies and sequencing of chemo-radiation are still trying to be defined. Finally, other areas of active investigation include chemoprophylaxis in patients at high risk for the development of breast cancer.

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Adjuvant Treatment of Breast Cancer

Wallace L. Akerley III, MD

New agents (for adjuvant therapy) are continuously in development and offer great promise.

Breast cancer is a common disease with the potential of systemic spread when first seen by the physician. Despite the apparent limited extent of disease in patients with early stages I or II (axillary node involvement or less), the 5-year survivals following mastectomy alone may be less than 25% as a consequence of distant relapse. Therefore, great efforts have been expended to define an effective systemic therapy that may be administered as an adjuvant to (ie, in addition to) the primary, local therapy of the breast lesion. Immunotherapy, hormonal and cytotoxic chemotherapy have been studied intensively with clear findings of clinical and cost-effective benefits for hormonal and cytotoxic chemotherapy.[1,2] Consequently, the effectiveness of adjuvant therapy is no longer in question and the goal of research has shifted to increasing the magnitude of the benefit within prognostic risk groups.

The contemporary management of breast cancer therapy, largely in response to the findings of randomized clinical trials, has undergone a major evolution during the last 15 years. The results of the adjuvant trials are best summarized by the *Overview Analyses of the Early Breast Cancer Trialists' Collaborative Group*.[1,3] The most recent *Overview* is a meta-analysis of all accessible randomized trials with at least 10 years of follow-up regarding any aspect of systemic adjuvant therapy for early breast cancer that began before 1985.[1] Information from individual patients within the trials was sought and centrally reviewed for prognostic factors, outcome and treatment for each of the 75,000 women randomized in 133 trials who cumulatively suffered more than 31,000 recurrences and 24,000 deaths. The results are expressed in terms of proportional reduction in annual risk of recurrence or death (ie, the percentage decrease in the number of events observed in the therapy arm compared to the number of expected events predicted by the control arm).

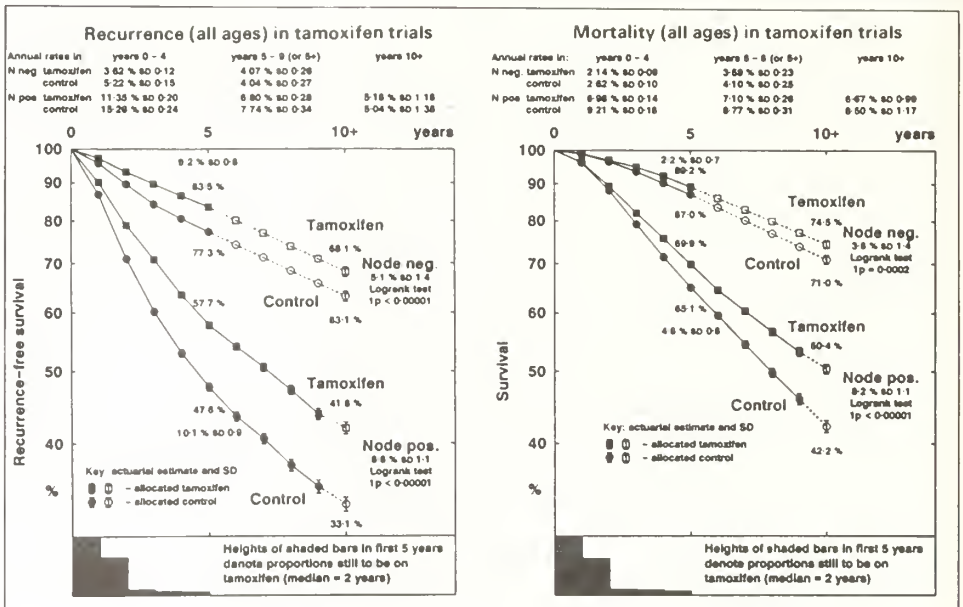
Recurrence (all ages) in tamoxifen trials
Mortality (all ages) in tamoxifen trials
Recurrence-free survival
Survival
Tamoxifen
Control
Node neg.
Node pos.
Key: actuarial estimate and SD
- allocated tamoxifen
- allocated control
Heights of shaded bars in first 5 years denote proportions still to be on tamoxifen (median = 2 years)

Fig 1.—Ten-year outcome in tamoxifen trials, subdivided by nodal status.

Table 1.—Effects of Tamoxifen in Women with Breast Cancer by Age, Duration of Therapy and Estrogen Receptor Status

	Percent Reduction in Annual Odds of:					
	Recurrence or Prior Death			Death from Any Cause		
	<50yrs	≥50 yrs	All	<50yrs	≥50 yrs	All
Tamoxifen						
Tam vs No Tam	12 (4)	29 (2)	25 (2)	6 (5)	20 (2)	16 (2)
Tamoxifen Duration						
<1yr vs No Tam	5 (7)	19 (4)	16 (3)	4 (8)	13 (4)	11 (4)
2 yr vs No Tam	10 (5)	33 (3)	28 (2)	4 (6)	23 (3)	19 (3)
>2 yr vs No Tam	43 (*)	38 (5)	39 (4)	27 (*)	23 (6)	24 (6)
Estrogen Receptor						
ER <10 fmol/mg	3 (8)	16 (5)	13 (4)	-5 (*)	16 (6)	11 (5)
ER >10 fmol/mg	19 (6)	36 (3)	32 (3)	13 (8)	23 (4)	21 (3)
ER unknown	12 (7)	26 (3)	22 (3)	8 (8)	17 (4)	15 (3)
Nodal Status						
Node-Negative	22 (8)	28 (4)	26 (4)	19 (*)	16 (5)	17 (5)
Node-Positive	11 (4)	33 (2)	28 (2)	5 (5)	22 (3)	18 (2)

( )indicates standard deviation, * indicates unstable results
Adapted from Table III, reference 1

Results for Adjuvant Tamoxifen

Tamoxifen is a cytostatic anti-estrogen whose putative biologic effects in hormonally responsive breast cancer are felt to be exerted through competitive inhibition of estradiol binding to the estrogen receptor. The adjuvant use of tamoxifen has resulted in a highly significant reduction in the annual rates of recurrence and death. A 25% reduction in the annual risk of relapse and a 16% reduction in annual mortality were noted. Figure 1 shows the recurrence and survival curves for patients treated with and without tamoxifen. The major protective effect of tamoxifen for the prevention of relapse occurs during the first 5 years of therapy when the tamoxifen and no-tamoxifen curves diverge. Thereafter, the curves become parallel and the benefits of treatment are maintained. The pattern for the survival curves is very different with con-

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ABBREVIATIONS USED
CMF: Cyclophosphamide, methotrexate, fluorouracil
ER: Estrogen receptor

Table 2.—Effects of Chemotherapy in Women with Breast Cancer by Age Percent Reduction in Annual Odds of:						
	Percent Reduction in Annual Odds of:					
	Recurrence or Prior Death			Death from Any Cause		
	<50yrs	≥50 yrs	All	<50yrs	≥50 yrs	All
Polychemotherapy						
Chemo vs None	36(5)	24(3)	28(3)	24(5)	13(4)	17(3)
Node Status						
Negative	26(*)	27(*)	26(7)	6(*)	23(*)	18(8)
Positive	41 (5)	23 (4)	30 (3)	30 (6)	11 (4)	18 (3)

( )indicates standard deviation, * indicates unstable results
Adapted from Table IV, reference 1

tinued divergence over the full 10 years of observation so that the absolute cumulative difference in survival increases yearly.

Subset analyses by age (Table 1) demonstrate qualitatively similar trends for women of all ages, but the benefits of tamoxifen were quantitatively less in younger women. For women under age 50 the annualized risk reduction for recurrence was 12%, whereas for women 50 years or older the annual rate was 29%. Similarly, the reduction in the annual odds of death was only 6% for women below 50 years of age, but 20% for those older.

Age appeared to be a more important predictor of response than menopausal status. Both pre- and post-menopausal women under 50 had a 12% reduction in annual recurrence. For women ages 50–59, similar reductions in recurrence were noted as 33% and 28% and in mortality as 23% and 19% for pre- and post-menopausal women respectively. While menopause is closely associated with age, it appears unrelated to the likelihood of benefit from tamoxifen within perimenopausal age groupings.

All evaluated schedules and doses of tamoxifen were beneficial in reducing the risk of annual relapse and mortality, but a statistically significant trend was appreciated favoring longer therapy. For durations of therapy of ≤1 year, 2 years and >2 years, the reductions in recurrence were 16%, 28% and 39% and, for mortality, were 11%, 19% and 24% respectively. In women over 50 a 2-year schedule appeared to provide similar benefit in terms of mortality (23% reduction in risk) compared to those schedules longer than 2 years. The optimal duration of therapy, although greater than or equal to 2 years, however, can not be determined through the *Overview* analysis. Doses greater than 20 mg daily did not appear to yield further benefit.

Results of therapy by estrogen receptor (ER) status were somewhat in conflict with popular dogma. Reductions in the overall annual odds of recurrence and mortality were noted whether the ER status was positive, negative or unknown. The benefits, as expected, were greatest in the estrogen receptor-positive subset with proportional decreases in recurrence and mortality of 32% and 21% respectively, but half of these beneficial effects were still realized in the estrogen receptor-negative subset who experienced 13% and 11% overall reductions in relapse and mortality. In the ER unknown subset, the results were intermediate as one might expect from an unevaluated group comprised of a mixture of ER positives and negatives.

Tamoxifen was also effective regardless of nodal status. The annualized risk reduction for recurrence was 26% and 28% for node negative and node positive status respectively and 17% and 18% for mortality. In those younger than 50 years, tamoxifen remains beneficial, but greater variability exists in the annualized hazard rates. Although the reductions in proportional risk were similar, the node-positive group experienced the greater absolute reduction in risk at both 5 and 10 years (Figure 1) because their initial overall risk was greater.

The adjuvant use of tamoxifen has resulted in a highly significant reduction in the annual rates of recurrence and death.

Other benefits of tamoxifen included a decreased risk of developing contralateral breast cancer and a favorable cardiovascular profile. Although the tamoxifen-treated group had a longer disease-free survival and therefore a greater opportunity to develop a new cancer compared to the control group, a 39% reduction in the risk of contralateral cancer was appreciated. Cardiovascular deaths were not increased in the tamoxifen arm.

Results of Adjuvant Chemotherapy

The *Overview* provides evidence of a more uniform benefit of adjuvant chemotherapy in early breast cancer than originally anticipated from the outcome of individual randomized trials. Cytotoxic chemotherapy with multiple agents for prolonged periods was broadly effective in reducing the annual risk of recurrence and increasing survival in all age groups and stages of nodal involvement. Durations of adjuvant therapy greater than 6 months did not result in additional benefit. Combination chemotherapy yielded a 28% decrease in the annual risk of recurrence and a 17% reduction in mortality risk when compared to no chemotherapy (Table 2). These reductions in risk of relapse and mortality were noted in both the node-positive population at 30% and 18% and in the node-negative group at 26% and 18% respectively. For recurrence, the absolute benefit increased yearly during the first five years and remained constant there-

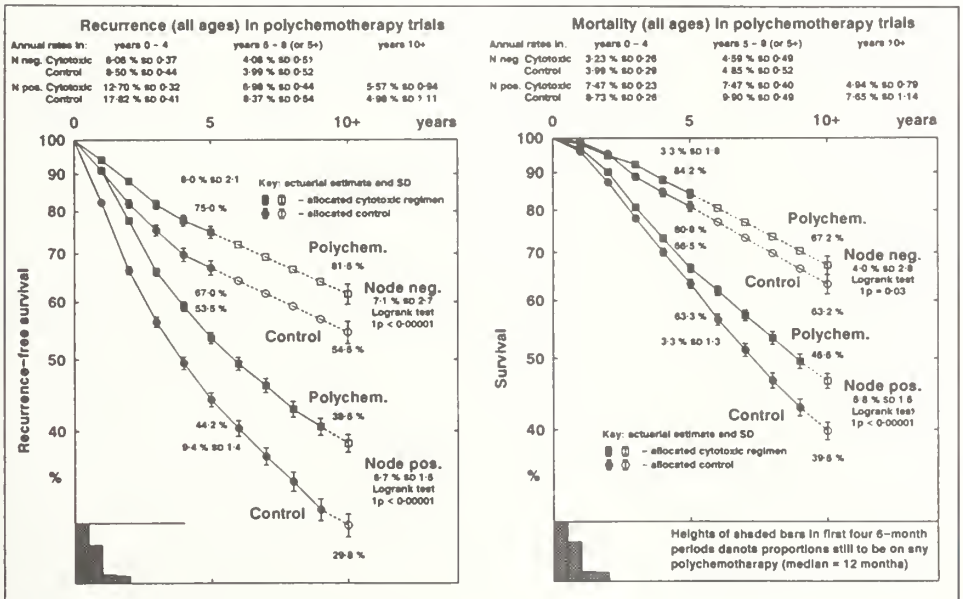
Recurrence (all ages) in polychemotherapy trials
Mortality (all ages) in polychemotherapy trials
Recurrence-free survival
Survival
Polychem.
Node neg.
Node pos.
Control
Key: actuarial estimate and SD
Heights of shaded bars in first four 6-month periods denote proportions still to be on any polychemotherapy (median = 12 months)

Fig 2.—Ten-year outcome in polychemotherapy trials, subdivided by nodal status.

after (Figure 2). The risk reduction in survival, however, was apparent in each of the 10 years of observation. This pattern of early improved disease-free survival, which is subsequently maintained, and continued improvement in overall survival with each passing year is similar to that noted with adjuvant tamoxifen.

The risk reductions afforded by chemotherapy demonstrated a statistically significant trend toward greater efficacy in younger women (recurrence P=0.0006, survival P=0.01), but were highly significant in women of all ages (Table 2). Women under 50 years of age had a 36% reduction in annual risk compared to 24% for older women and a 24% reduction in annual mortality compared to 13% for those older than 50. It should be noted that few women greater than 70 years of age received chemotherapy in randomized trials reviewed by the *Overview*, so the chemotherapy data for those older than 50 reflects only ages 50–69. The relationship of menopause to the effectiveness of chemotherapy could not be statistically separated from age because too few older pre-menopausal women were treated to reach valid conclusions.

No specific combinations of multi-agent chemotherapy demonstrated superior efficacy from the 31 trials evaluated that were directly compared to no chemotherapy. Possible explanations include a true lack of superior efficacy between the particular regimens, a general homogeneity of those regimens tested or the inherent statistical difficulty in separating one variable from the rest as the number of variables increases. The most commonly employed regimen was CMF (cyclophosphamide, methotrexate and fluorouracil) or a CMF-variant, which accounted for 18 of the 31 regimens. Anthracyclines were present in only 6 of the combinations, which may restrict conclusions, but anthracycline-containing regimens were not superior compared to non-anthracycline regimens. Issues of potential differences in scheduled and delivered dose intensity could not be addressed.

Results of Adjuvant Combined Chemoendocrine Therapy

The beneficial effects of chemotherapy and hormonal therapy, although highly statistically significant when assessed individually, may be less predictable when used in combination and may yield cumulative synergy, additivity or antagonism. Many potential interactions between tamoxifen and chemotherapy exist. For example, *in vitro* the cytostatic capacity of tamoxifen can antagonize the cytotoxic effects of chemotherapy as the latter acts predominantly on actively cycling cells.[4] Also, adjuvant chemotherapy results in a high frequency of premature menopause in young women. This chemotherapeutic-induced premature ovarian failure pattern may compete with the anti-estrogen effects of tamoxifen and result in less than complete additivity of chemoendocrine therapy. Further, pre-menopausal women on tamoxifen who do not enter menopause develop compensatorily elevated levels of estrogen that may also contribute to interactions in combination therapy. Unfortunately, only certain aspects of these relationships can be evaluated by the *Overview* despite the statistical power of large numbers.

Table 3.—Effects of Chemoendocrine Therapy in Women with Breast Cancer by Age

	Percent Reduction in Annual Odds of: Recurrence or Prior Death			Death from Any Cause		
	<50yrs	≥50 yrs	All	<50yrs	≥50 yrs	All
CTX vs No CTX	36 (5)	24 (3)	28 (3)	24 (5)	13 (4)	17 (3)
Chem/tamvsTam	32(*)	26(5)	28(6)	-6(*)	10(7)	5(*)
Chem/tam vs Chem	7 (4)	28 (3)	24 (3)	3 (5)	20 (4)	16 (3)
Tam vs No Tam	12 (4)	29 (2)	25 (2)	6 (5)	20 (2)	16 (2)

( )indicates standard deviation, * indicates unstable results
Adapted from Table III+IV, reference 1

Cytotoxic chemotherapy with multiple agents for prolonged periods was broadly effective in reducing the annual risk of both recurrence and increasing survival in all age groups and stages of nodal involvement.

For women of ages 50–69 years with breast cancer, the *Overview* supports independence between tamoxifen and chemotherapy. In these patients, the calculated proportional risk reduction of the combination matches the measured reduction observed with individual therapies when additivity was assumed with annual risk reductions calculated as 45% for recurrence and 30% for survival. This argues against a clinically significant *in vivo* cytostatic antagonism of tamoxifen on chemotherapy in general, but does not bear inference on a chemotherapeutic interaction with tamoxifen in pre-menopausal women. For women older than 70 or under 50, insufficient data prevents reliable prediction of a potential interaction. It does appear reasonable to assume that some degree of incomplete additivity will exist with combined therapy within certain subsets of patients (Table 3).

Discussion

The *Overview* demonstrates statistically significant reductions in the annual rates of both recurrence and death with adjuvant tamoxifen, ovarian ablation for women younger than 50 and for cytotoxic chemotherapy for women younger than 70. In certain subsets of patients, some therapies were more effective than others. Efficacy was often noted to be age-related with tamoxifen showing greater effectiveness in older patients while ovarian ablation and chemotherapy had a greater benefit in younger patients. The summary of these results provides an invaluable guide in selecting adjuvant therapy for patients with early breast cancer (Table 4).

Despite this extraordinary effort by the *Early Breast Cancer Trialists' Collaborative Group*, the *Overview* serves to define only the lower limit of therapeutic efficacy of systemic adjuvant therapy. During the last 10 years since the last of the trials evaluated by the *Overview* were conceived, many important advances have occurred. Data suggests that the intensity of the delivered dose of chemotherapy may be as im-

Table 4.—Effects of Chemotherapy or Endocrine Therapy by Age and Menopause

		Percent Reduction in Annual Odds of: Recurrence			Mortality		
Age	Menopause	Chemo	Tam	Ablation	Chem	Tam	Ablation
<50	Pre	36(5)	12 (4)	26 (6)	25 (6)	6(5)	25 (6)
<50	Post	37(19)	12(15)		&( )	& ( )	
50-59	Pre	25(9)	33(7)		23 (9)	23 (9)	
50-59	Post	29(5)	28(3)		13 (7)	19 (4)	
60-69	Any	20(5)	29(3)		10 (6)	17 (4)	
70+	Any	&()	28(5)		&()	21 (6)	

& indicates too few patients, ( ) Indicate standard deviation
Adapted from Figures 14+15, reference 1

portant a variable in adjuvant therapy[5] as the type of individual drugs. Anthracycline-based regimens may offer a therapeutic advantage over a CMF-based regimen as noted in metastatic disease and within certain subgroups in early breast cancer.[6] New agents are continuously in development[7,8] and offer great promise. Paclitaxel and vinorelbine, which are relatively new agents, have demonstrated significant efficacy in metastatic disease refractory to standard chemotherapy and are presently under evaluation in adjuvant clinical trials. A new class of antiemetics, the anti-seritonergic,[9] are now used in standard practice, which abrogates much of the toxicity that once prevented many patients and physicians from considering systemic chemotherapy in the adjuvant setting. Hematopoietic growth factor support,[10] another recent development, prevents infectious toxicity and delays in therapy due to cytopenia. These ancillary therapies may indirectly enhance chemotherapeutic activity through enhanced dose intensity from existing treatment strategies. Finally, phenotypic, kinetic and genotypic classification of breast cancer are only now beginning to yield important prognostic information,[11] which hint at potential new mechanisms of molecular treatment.[6,12] To date, the advances in the adjuvant therapy of early breast cancer have been uniformly positive, but incrementally small. It is hoped that biomedical science will soon provide us with a therapeutic breakthrough of such obvious benefit that the statistical power of a metaanalysis will no longer be needed to measure its effect.

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Locally Advanced Breast Cancer: Integration of Multimodal Concepts

S. Eva Singletary, MD

> ***. . . involvement of the patient and family members about the diagnosis, treatment options, side effects, and post-operative care enhances their ability to adjust to the disease and its treatment.***

Unfortunately, physicians are still confronted today with the local and systemic management of locally advanced breast cancer. Although locally advanced breast cancer has decreased in frequency to less than 5% in mammographically screened populations, it represents 30% to 50% of newly diagnosed breast cancer cases in medically underserved areas of the United States and in many other countries.[1,2]

As is true for early-stage breast cancer, the extent of the surgical procedure in locally advanced breast cancer does not influence survival as much as does the extent of undetectable micrometastases present at the time of diagnosis. In 1943, based on the outcomes of 1,135 breast cancer patients treated with radical mastectomy from 1915 to 1942, Haagensen and Stout[3] defined the clinical features of locally advanced breast cancer that predicted a 50% or greater chance of local recurrence and a 0% 5-year survival rate: extensive edema involving more than two-thirds of the breast, satellite skin nodules, "inflammatory" carcinoma, or edema of the arm. Patients with less extensive skin edema (one-third of the breast), skin ulcerations, tumor fixation to the chest wall, or fixed axillary nodes had a local recurrence rate of 13% to 32% and a 5-year survival rate of 5% to 36%: if two or more of these features were present, the local recurrence rate was 40%, with a long-term survival rate of less than 5%. High-dose radiotherapy subsequently replaced surgery as the local therapy of choice for locally advanced breast cancer, producing an overall 21% 5-year survival rate in combined series.[4,5] However, high-dose radiotherapy was often associated with severe side effects such as fibrosis and skin ulceration, brachial plexopathy, and lymphedema of the arm.

In the early 1970s, the concept of integrating systemic chemotherapy into a combined-modality approach with local therapy was initiated based on the paradigm that survival is dependent upon the systemic eradication of occult micrometastases. For the past 20 years, patients with primary breast cancers larger than 5 cm in diameter (T3), with skin or chest wall involvement (T4), or with matted or fixed axillary lymph nodes (N2) have been treated at The University of Texas M.D. Anderson Cancer Center with a multimodal approach: preoperative (induction) combination chemotherapy, surgery, and, in selected patients, irradiation.[6] All stage II or III patients who are considered candidates for preoperative chemotherapy are reviewed in a multidisciplinary clinic in which a medical oncologist, radiotherapist, surgeon, and preferably a radiologist and pathologist are available. Tissue for histologic diagnosis and determination of hormone receptor status and proliferative markers (S-phase fraction determined by flow cytometry or Ki67) is usually obtained by fine-needle aspiration or a core needle biopsy. If there is no clinical evidence of invasion, such as skin involvement or proven nodal metastases, a core needle biopsy is required to confirm actual invasion rather than the presence of a large palpable mass of *in situ* (noninvasive) disease. A careful review of bilateral mammograms is performed with particular attention given to identifying possible synchronous bilateral disease, ipsilateral multicentricity, and the radiographic extent of disease. Similarly, a baseline ultrasound examination of the breast and nodal basins is often performed to help delineate tumor size and the presence of nonpalpable nodal disease.[7] Our preference at the University of Texas M.D. Anderson Cancer Center has been to use doxorubicin (Adriamycin)-containing combination chemotherapy such as 5-fluorouracil, doxorubicin, and cyclophosphamide (FAC) as induction chemotherapy for patients with locally advanced breast cancer or with T2 tumors (2 cm to 5 cm) if the cosmetic result could be improved by decreasing the tumor size and thus the extent of surgery needed. We inform patients of the opportunity to participate in innovative therapies such as a comparison study of induction chemotherapy with FAC versus paclitaxel (Taxol). For patients whose disease initially can be resected with clear margins, the option of surgical excision (standard mastectomy) followed by postoperative systemic therapy (hormonal therapy or chemotherapy) is also discussed.

Most patients (80%) have significant tumor shrinkage after 3 or 4 cycles of preoperative chemotherapy, and 15% to 20% experience a complete clinical remission. After 4 cycles of preoperative chemotherapy, the patient is seen again at the multidisciplinary clinic. At that time, a group consensus on tumor response (clinical and radiographic) is reached, and further treatment decisions are made. If an adequate tumor response is not achieved with the induction chemotherapy, the patient is given a different chemotherapy program or receives preoperative radiation. If the tumor is resectable, surgery is performed at the time of hematologic recovery from the chemotherapy-induced bone marrow suppression.

The preoperative chemotherapy is usually well tolerated, and surgical procedures can be completed without an increased risk of infection or delayed wound healing.[8] Currently, all breast surgery without reconstruction is performed on an outpatient basis. Usually a postoperative observation period of less than 23 hours is required. Before surgery, the patient and her family are educated on the treatment plan and trained in the home management of the suction catheters. This involvement of the patient and family members in discussions about the diagnosis, treatment options, side effects, and postoperative care enhances their ability to adjust to the disease and its

ABBREVIATIONS USED

FAC: 5-fluorouracil, doxorubicin, cyclophosphamide

GY: Gray (a unit of measurement in X-radiation.)

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treatment. Postoperative adjuvant therapy can usually start 10 to 14 days after surgery.

Preoperative chemotherapy does not interfere with prognostic surgical staging information.[9,10] Tumor response to preoperative chemotherapy as confirmed by histologic examination of the mastectomy specimen is an excellent prognostic factor for survival. The number of positive axillary lymph nodes measured after preoperative chemotherapy is also an excellent prognostic factor for survival. In our experience, the actuarial 5-year survival rate was 70% for patients with negative nodes, 62% for those with 1 to 3 positive nodes, 47% for those with 4 to 10 positive nodes, and 21% for those with more than 10 positive nodes (Figure 1). The 5-year disease-free survival rates were 72%, 46%, 35%, and 6%, respectively. When the subsets of patients with 4 or more positive nodes were combined, the overall survival rate at 5 years was 38%, and the disease-free survival rate was only 20%. This dismal survival rate associated with macroscopic residual disease after preoperative chemotherapy parallels results for locally advanced breast cancer treated with mastectomy and postoperative radiation without systemic therapy.[11] An alternate treatment option for patients with 4 or more positive nodes after preoperative chemotherapy or for patients with 10 or more positive axillary nodes who do not undergo induction chemotherapy is enrollment in a randomized trial of standard chemotherapy (eg, FAC), with or without consolidation with high-dose intensification chemotherapy (eg, cisplatin, etoposide, and cyclophosphamide) or a crossover chemotherapy regimen of promising new agents such as paclitaxel.

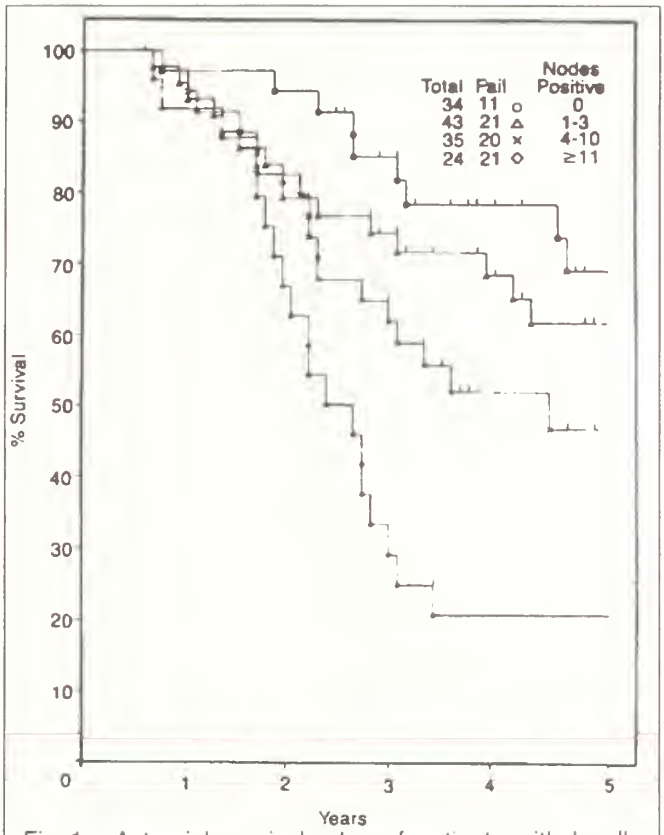

Fig 1.—Actuarial survival rates of patients with locally advanced breast cancer according to the number of axillary lymph node metastases present after preoperative chemotherapy. Reprinted with permission.[10]

Today, because most cases of locally advanced breast cancer involve large tumors that are technically resectable by standard mastectomy, the advantages of preoperative chemotherapy are that it allows selection of therapeutic strategies based on the tumor's *in vivo* chemosensitivity and increases the frequency of breast preservation.

The criteria for breast preservation surgery after induction chemotherapy for locally advanced breast cancer include resolution of skin edema (*peau d'orange*), residual tumor size of less than 5 cm, absence of extensive intramammary lymphatic invasion or extensive suspicious microcalcifications, no evidence of multicentricity, and the patient's desire for breast preservation (Table 1).[12] In our experience of 203 evaluable patients with stage IIA through stage IV breast cancer who completed 4 cycles of preoperative chemotherapy (FAC) from 1989 to 1991, breast preservation was elected and performed in 51 (25%) (Figure 2). The breast preservation rate for patients with ulcerative lesions or dermal lymphatic skin involvement (stage IIIB) was only 6%. With a median follow-up of more than 43 months (range 29–61 months), only 4 patients have had relapses, and 2 of these remain disease-free after mastectomy.

Recently, this approach of induction chemotherapy has been used even in patients with smaller primary tumors (2 cm to 5 cm). In Bonadonna et al's pilot study[13] of 227 women with primary tumors at least 3 cm in largest diameter without skin or chest wall involvement, patients whose tumors were down-staged by preoperative chemotherapy to less than 3 cm at surgery underwent quadrantectomy (minimum margin of 2 cm) and irradiation (5 fractions per week for a total dose of 60 Gy in 6 weeks). One of five different drug regimens was used for 3 to 4 cycles preoperatively, with additional postoperative chemotherapy (2 to 3 cycles) given to patients with positive nodes or with negative nodes but estrogen receptor-negative tumors. Clinical response was determined by palpation before surgery; 21% of patients had complete responses, 57% had partial responses, 15% had objective improvement, and 3% had progressive disease. Response rates were unrelated to the drug regimen used. Breast preservation was possible in 91% of patients (n=183) with an initial tumor size of 3 cm to 5 cm and in 73% of patients (n=37) with tumor size larger than 5 cm. At a median follow-up from preoperative chemotherapy of 30 months, the local recurrence rate was 2%, and the overall survival rate was 93%. These encouraging preliminary results suggest that breast preservation may be an appropriate treatment option for selected patients with locally advanced breast cancer.

If breast preservation surgery is performed, radiopaque hemoclips should be placed at the base of the excision defect in the breast to guide the radiotherapist in planning the radiation fields.[14] Currently, regardless of whether the breast is preserved or removed, a level I and II axillary lymph node dissection (removal of lymph nodes lateral and posterior to the pectoralis minor muscle) is included for histologic assessment of tumor response to the induction chemotherapy and for identification of patients who may qualify for dose-intensive chemotherapy programs (ie, patients with 4 or more positive nodes after induction chemotherapy). The necessity of axillary node dissection and its future role in treatment are being addressed in investigational clinical trials.

In patients with locally advanced breast cancer who need or elect to have standard mastectomy, breast reconstruction surgery is often delayed until completion of both adjuvant chemotherapy and irradiation.

Table 1.—Criteria for Breast Preservation Surgery after Induction Chemotherapy for Locally Advanced Breast Cancer

Resolution of skin edema (dermal lymphatic involvement)
Residual tumor size of less than 5 cm
Absence of extensive intramammary lymphatic invasion
Absence of extensive suspicious microcalcifications
No known evidence of multicentricity
Patient's desire for breast preservation

Fig 2.—A 40-year-old woman with T2 N2 M0 carcinoma of the left breast who underwent segmental mastectomy and axillary node dissection after 4 cycles of induction chemotherapy with 5-fluorouracil, doxorubicin, and cyclophosphamide (FAC). No residual tumor was found in the breast or axillary nodes. Postoperatively, she received 5 cycles of FAC followed by radiation to the breast and peripheral lymph nodes. She was free of disease at the 38-month follow-up visit. Reprinted with permission.[19]

Although systemic chemotherapy by itself may decrease locoregional recurrence, the addition of radiotherapy to chemotherapy has been shown to lower recurrence to only 3% in stage II patients and 8% in stage III patients.[15] As most locoregional recurrences are in the skin or subcutaneous tissue of the chest wall, a flat postmastectomy chest wall often makes irradiation technically easier than does a reconstructed breast mound. Because of loss of elasticity of the skin and underlying tissues after irradiation, tissue expansion for implant reconstruction in an irradiated field has been disappointing, with a high complication rate as well as patient discomfort and dissatisfaction. The use of a myocutaneous flap for breast reconstruction has not interfered with the resumption of chemotherapy or the ability to detect locoregional recurrence.[16] Thus, in selected patients with excellent response to chemotherapy or when palliative debulking surgical procedures are needed, the preference is to use an autogenous flap (latissimus dorsi or rectus abdominis myocutaneous transfer) to create a breast mound or to provide skin coverage of the operative defect without the use of skin grafts.

In patients with persistent (chemoresistant) advanced primary disease or locoregional recurrences, close cooperation between the medical and surgical oncologists and the reconstructive surgeon is required to assess the advisability of major surgical resections with an in-depth understanding of the short- and long-term morbidity of the surgical procedure itself.[17] In general, quality palliation can often control local symptoms of pain, hemorrhage, and malodorous ulceration. However, if life expectancy is anticipated to be very short, as with patients who have bulky visceral disease or metastases nonrespondent to multiple chemotherapy regimens, the true benefit of a complex but technically feasible operation should be evaluated carefully.

The strength in the management of locally advanced breast cancer lies in the team approach to multimodal care.[18,19] The physician must be a careful listener and incorporate the patient's perspective and goals to arrive at a final decision about a treatment plan for either the initial presentation of the disease or its subsequent relapse. Patients should be empowered to participate actively in this decision-making process.

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Molecular Biology of Breast Cancer: Integration of Cellular And Molecular Concepts into Therapeutic Strategies

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In most human cancers many genetic changes have been demonstrated at the molecular level. These events include point mutations, deletions, gene fusion and gene amplifications.

Carcinogenesis arises as a result of chemical, physical, biologic, and/or genetic insults to the cells. Specific external causative factors that may initiate the process include smoking, occupational and environmental chemicals, radiation, dietary factors and specific promoters for cancers of hormone-responsive tissues, such as the breast, endometrium, ovary and prostate. Genetic factors also have an important influence on an individual's susceptibility to cancer.

BRCA1 and BRCA2 Genes

Arguably the most meaningful development in breast cancer research since its beginnings, the recent isolation of the first gene definitely linked to breast cancer, marks the attainment of a long sought goal. The gene, named BRCA1, was recently identified in a region of chromosome 17.[1,2]

BRCA1 is believed to be an anti-oncogene, or tumor suppressing gene. Research data indicate that most women are born with two healthy copies of BRCA1, and have a 12% risk of developing breast cancer over their life-span as environmental or other factors may initiate mutations of these copies. Women born with a defective copy of BRCA1 appear to have an 85% risk of developing breast cancer during their lives and are also at a higher risk of getting the disease at an earlier age. This estimate of risk, several experts said, is based on data from a limited number of families, and is an average for all BRCA1 defects. [3–5]

So far, in all the cases of breast cancer attributable to a BRCA1 mutation, the mutation has resulted as inherited defects with complete lack of the BRCA1 gene in sporadic cancer BRCA1 causing phenotypic evidence of breast cancer when mutated. Still it is suggested that mutations may cause breast cancer through other mechanisms (eg, deletion). Carcinogenesis may also involve mutations in a regulatory region of the gene rather than its coding sequence. These regulatory regions, which have yielded mutation so far, have not been screened as thoroughly as the coding regions. In any case, it would appear that BRCA1 is only one of several or even many genes that may trigger breast cancer. Of the 5% to 10% of breast cancer cases that result from heredity, the BRCA1 gene appears to be implicated only in about one-half. Another gene, BRCA2, is considered to be responsible for many hereditary breast cancer cases not initiated by BRCA1 mutations.[3,6–8]

Mutations of BRCA2 differ in significant ways from BRCA1. While BRCA1 mutations are linked to a high risk of both breast and ovarian cancer, BRCA2 does not appear to be involved in ovarian cancer.[9,10] However, BRCA2 seems to be the causative factor of breast cancer in males, a rare problem in the general population. Of interest, only 5% to 10% of the breast cancer cases are attributed to the recently discovered genes.[11–13] For the remaining 85% to 90% of breast cancer cases, the cause of the cancer is still undetermined genetically. The multistep aspects of carcinogenesis include an initiation step (or steps) that involves changes at the genetic (molecular) level followed by a number of promotion and progression steps that progress to malignancy. Oncogenes play a key role.

Oncogenes

The proto-oncogenes represent a group of genes that encode proteins with normal function, usually including growth factors, growth factor receptors or enzymes. These genes have known potentials for tumorigenic or transforming action, when they are altered or expressed abnormally. The role of oncogenes in the pathogenesis and progression of human malignancies has been the field of intensive molecular biologic investigation. The generic name "oncogene," which defines a gene responsible for causing cancer, is an oversimplified approach, since the genesis of neoplastic transformation is a multifactorial, complicated and multistep phenomenon.[14,15] Nevertheless, since there is ample evidence to suggest that tumorigenesis results from accumulation of genetic abnormalities, it is reasonable to believe that genetic alterations such as oncogene overexpression play an important role in the pathogenesis of breast cancer. Further, these molecular events may predict an aggressive tumor phenotype and could serve as prognostic markers for the selection of optimal treatment for patients.

Five oncogenes have been confirmed to possess a role in human breast cancer: c-*erb*B-2, c-*myc*, *int*-2, c-Ha-*ras* and p53. These genes are normally cellular genes, likely to be involved in the normal cell growth or differentiation. Each acts at different cellular levels and are important in the discovery of the mechanisms of mammary tumorigenesis, as they may cooperate to unveil the malignant cell phenotype.[16,17]

The most studied oncogene in breast cancer is the c-*erb*B-2. This gene, also known as HER-2/*neu*, is located on chromosome 17q21 and encodes a 185 Kd membrane bound receptor, with properties similar to the Epidermal Growth Factor Receptor (EGFR): both are transmembrane proteins, possess tyrosine kinase activity with similar structures. It seems that the EGFR and c-*erb*B-2 are somehow related, but the ligand is as yet unknown. Nevertheless, their molecular homology suggests that the latter is a membrane-bound growth factor receptor.

The c-*myc* gene is the cellular counterpart of the viral transforming gene v-myc, which encodes the protein *myc*, a nuclear transforming factor. Although its precise function is unknown, it seems that the protein *myc* plays an essential role in the control of cell proliferation through the nuclear protein MAX (c-*myc*-associated protein x).[18] Translocation, mutation or amplification of the c-*myc* gene leads to its overexpression, which has been implicated in the pathogenesis and progression of many malignant diseases, such as Burkitt's lymphoma, small-cell lung carcinoma, leukemia and breast cancer.[19] The *int*-2 gene is an oncogene coding a protein of the fibroblast growth factor (FGF) family.[20] It is located on chromosome 11q13, closely linked to other on-

ABBREVIATIONS USED

11 lq13: Chromosome region
BRCA1: Breast cancer gene #1
BRCA2: Breast cancer gene #2
DNA: Deoxyribonucleic acid
EGF: Epidermal growth factor
EGFR: Epidermal growth factor receptor
FGF: Fibroblast growth factor
GTP: Guanosine triphosphate
MAX: c-myc associated protein X
PDGF: Platelet- derived growth factor

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cogenes as the bcl-1, c-sea and hst.

The normal homologue of c-Ha-*ras* oncogene is a GTP-binding protein that activates intracellular second messengers. By point mutation, as observed in chemically induced mouse mammary tumors, the protein acquires a different behavior, leading to a rather permanent activation of GTP.[17] In addition, k-*ras* and N-*ras* family genes are very rare in breast cancer compared to adenocarcinomas of other organs.[21]

The p53 gene is an anti-oncogene or tumor suppressor gene. The loss of function of this group of genes leads to malignancies. Since one allele is sufficient to inhibit tumorigenesis, both alleles must be inactivated for the induction of cell transformation.[22,23] p53, being located on chromosome 17q, functions to regulate gene transcription and cell growth and proliferation through modulation of p53 phosphorylation.[24,25] It is normally expressed in all human cells at very low levels late in the G1 phase of the cell cycle and regulates the entry of the cell into the S phase, where DNA synthesis takes place. p53 is a sequence-specific DNA-binding phosphoprotein that can be detected in either the cytoplasm or the nucleus, where it exerts its tumor suppressor activity.[26]

Evidence of Oncogenes' Role

The c-*erb*B-2 amplification in human adenocarcinomas was first described in 1986. The following year, Slamon et al[27] reported that the gene was amplified in 30% of breast carcinomas, associating this amplification with a poorer prognosis and maintaining that in axillary node-positive patients the degree of gene amplification correlated significantly with both disease-free and survival times. Since then several studies have been published and c-*erb*B-2 has been the subject of intense debate concerning its prognostic significance for women with primary breast tumor. In a univariate analysis by Slamon et al, c-*erb*B-2 gene amplification was as a prognostic marker equivalent to the number of metastatic axillary nodes and exceeded the hormone receptor status and the primary tumor size as prognostic indicators. In a later report, c-*erb*B-2 was found to be an independent predictor of both disease-free and overall survival in node-positive patients, but these results were not reproducible.[27]

Although more than 30 different groups have published papers addressing the clinical significance of c-*erb*B-2 overexpression in breast cancer, there is still a wide margin of uncertainty. The existing controversy is mainly explained by the different methodologies applied, retrospective nature. of the studies, use of archival tissues (with the potential loss of antigenic immunoreactivity), use of an arbitrary cutoff in determining c-*erb*B-2 amplification, inadequacies in statistical analysis and small study groups. Because of these factors, c-*erb*B-2 overexpression was reported varying in incidence from 10% to 42% and with conflicting prognostic significance.[27,28]

Two of the largest studies published (Lovekin et al, Winstanley et al), with 497 and 462 patients respectively, report a highly significant association between c-*erb*B-2 expression and poor survival.[29,30] Lovekin et al found c-*erb*B-2 status to be strongly associated with grade, while the Winstanley group showed c-*erb*B-2 to be an independent prognostic factor. However, the effect of histological grade was not tested.

In an attempt to correlate the c-*erb*B-2 overexpression with histopathological features, there are reports indicating that c-*erb*B-2 amplification occurs usually with the following presentations: (1) ductal type of breast malignancy, with large tumor cells; (2) extensive intraductal component of the central necrotic area[31] and (3) in stages III/IV more often than in stages I/II.[32] Another variable which has been examined for its affiliation with c-*erb*B-2 overexpression is the size of the primary tumor; conflicting results are evident.[30] Additional investigated associations are those between the c-*erb*B-2 status and markers such as the histological grade, hormonal receptor status, ploidy, and S-phase fraction. All possess low correlation coefficients, indicating that these associations are weak.[33]

Some investigators examined the prognostic significance of c-*erb*B-2 expression in sub-groups of patients defined by the conventional prognostic indicators. The results are again conflicting, with only the matching finding that the poor prognostic effect of c-*erb*B-2 overexpression is restricted to the node-positive patients.[29]

Another issue of investigation is the mechanism of c-*erb*B-2 overexpression and its prognostic effect. It may be through an undefined growth advantage that the c-*erb*B-2 positive cancer cells possess, or through the responsiveness to therapy as some reports indicate, that the prognostic effect of c-*erb*B-2 expression is stronger for overall survival than it is for disease-free period.[30]

In conclusion, c-*erb*B-2 expression appears to be more frequent in advanced tumor stages and in more poorly differentiated breast cancers. It is generally agreed that increased c-*erb*B-2 levels in women with positive axillary nodes portend a worse prognosis, but its role in the clinical management of breast cancer remains unclear, since the above information is of little prognostic value, as the node-positive patients are already candidates for adjuvant therapy.

p53

p53 mutations are probably the most frequent genetic changes so far identified in human cancer. Loss of the p53 gene's activity to bind to DNA and the subsequent failure to suppress transformation, can occur by several mechanisms: (1) loss of both p53 alleles; (2) by loss of one allele and a concomitant mutation that inactivates the other; or (3) by a mutation in one allele that dominantly suppresses the function of the wild-type protein encoded by the normal allele. Allelic deletions of p53 are observed in about 60% of breast carcinomas, while in about 30% (13% to 46%) of human breast cancers one allele of p53 is absent and the other is inactive. Although these events are characteristic of Li-Fraumeni syndrome, they do not seem to be associated with familial breast cancers.

p53 mutation in breast malignancies portends an aggressive breast cellular phenotype and is associated with negative hormone receptor status, high grade tumors and c-*erb*B-2 positivity. This mutation has also been associated with advanced stages of disease and shortened disease-free and overall survival.[34,35]

In summary, about 30% of human breast tumors have abnormalities of p53 and as many as 60% of tumors have p53 overexpression detectable immunohistochemically. Despite our poor understanding of p53 function, it is clear that loss of this tumor suppressor anti-oncogene is associated with the development of sporadic breast tumors with an aggressive phenotype.[36]

c-myc

In primary human breast cancer, amplification of c-*myc* was found in 16% to 33% of the patients.[37] c-*myc* expression is mainly associated with high-grade tumors and with aggressive inflammatory breast carcinoma. The role of its amplification in breast tumor progression is obscure. There is speculation that c-*myc* contributes to the growth and rapid progression of breast neoplasia, through the action of estrogen stimulation and growth. There also are indications that hormonal progression of breast cancer could be the result of enhanced expression of the c-*myc* gene. The presence of c-*myc* overexpression is linked in breast cancer, with unfavorable prognostic implications.

int-2

The int-2 gene is amplified in 15% to 20% of human breast cancers; while it has been correlated with tumor estrogen receptor positivity and with lymph node metastases, it is linked to adverse prognostic variables.[38]

Oncogene Coexpression

The multistep nature. of tumorigenesis is a widely accepted concept, which offers a convincing explanation for the close relationship of cancer incidence to age. Only recently, however, with the development of

molecular analysis, has it been shown that human cancer presents with multiple genetic lesions.[39,40] In most human cancers many genetic changes have been demonstrated at the molecular level. These events include point mutations, deletions, gene fusion and gene amplifications. Since it is almost impossible to directly observe the tumorigenesis process in humans, it cannot be proved retrospectively that these genetic alterations are causative, but rather may represent synchronous molecular transformation events that are not etiologic. Nevertheless, their high incidence in specific tumors arouses suspicions for their crucial role in the pathogenesis of malignancies.

As research data reveal the presence of more than one oncogene in malignant cells, there is accumulating evidence of a required coexpression between oncogenes to reveal the malignant phenotype. Cooperation or coexpression is defined as the action of oncogenes to transform in concert a normal cell into a tumorigenic cell line, whereas neither of the oncogenes alone has this capability. We have recently confirmed that the coexpression of various proto-oncogenes (c-*myc*, c-*fos*, Ha-*ras*, p53) possesses strong prognostic value for prediction of disease-free and overall survival in human breast cancer.[41] In the broader sense, the coexpression between oncogenes includes the loss of tumor suppressor gene activity, as an additional step towards the disclosure of the tumorigenic behavior.[42] There are many data from animal experiments that support this gene cooperation multistep model. It is known, for instance, that carcinogens cause oncogenic mutations in proto-oncogenes, but this does not initiate neoplastic transformation until other, secondary events are expressly initiated to promote tumorigenesis.[43,44] Experimental tumor models also suggest that oncogene activation does not have to occur in a particular order to induce cancer and it is, rather, the total accumulation of random oncogenic transformation molecular events that is important.[45] It has been shown that the number of genetic events observed will increase and correlate with the stage of the disease.

Recently, Fearon and Vogelstein, in a review on colorectal tumorigenesis, presented a model of oncogene cooperation for the genetic basis of colorectal neoplasms. They studied the most common genetic alterations in a series of disease states progressing from the hyperplastic adenoma to frank metastatic colon carcinoma; these investigators suggest a possibility of genetic alterations.[46] As human breast cancer comprises a broad variation of clinical presentations, ranging from the spectrum of the extremely aggressive neoplasm to that of indolent chronic disease, it offers an ideal model for the study of oncogene complementation. Indeed, there is accumulative evidence for oncogene cooperation in breast cancer: several authors have shown about 30% concordance of c-*myc* and *erb* B-2 overexpression,[33] while c-*myc* and *int*-2 coamplification has also been reported. In addition, *erb*B-2 amplification has been directly related with p53 alterations, mainly in high-grade breast malignancies. Of particular interest is the observation that the mechanism of action of each oncogene is distinct, with activation of different pathways of potential neoplastic transformation. The clinical significance of these genetic changes seems to be independent of each other, supporting the gene cooperation (co-expression) theory.[41] Clinical studies have shown that when both c-*myc* and *erb*B-2 overexpression occurs, tumors become even more malignant and the prognoses become particularly ominous.[47]

The findings of Roux-Dosseto and Martin support the theory of gene cooperation in primary breast cancer. These investigators correlated the clinical data of 170 breast cancer patients with amplification of the oncogenes *erb* B-2, c-*myc* and *int*-2. They were able to confirm that *erb*B-2 and *int*-2 overexpression is associated with prolonged disease-free survival when c-*myc* is normal compared with the group of patients with c-*myc* amplification. Furthermore, a positive cooperation has been shown for *erb*B-2 and c-*myc* overexpression in regard to early recurrence and shortening of overall survival. The poor prognosis of that group of patients was dramatically worsened when the *int*-2 gene was normal.[48] The above data support the hypothesis that oncogenes act synergistically to implicate complex cellular transformation. Sequential coexpression (cooperation) could be the result of different oncogene combinations, leading to similar effects (ie, recurrence), but within different time spans.[49]

New Therapeutic Strategies

Modern molecular methods have been developed that allow the stable transfer of foreign DNA sequences into human and other mammalian somatic cells. Currently, gene therapy predominantly involves the gene insertion either directly into a target cell (*in vivo*, or into an appropriate cell (*in vitro*), that is then introduced to a physiologically relevant anatomical site.[50,51] Until recently, gene therapy was considered by clinicians and researchers an unproven technology. In gene therapy the vector attaches to the tumor cell, but also gets to the "normal" surrounding cells (bystander effect). The vector possesses tissue distribution problems which are the same problems that we confront with the administration of chemotherapy. Today, using selective vectors and new insertion techniques, we have for the first time established encouraging clinical results. Since the first US clinical trial began in 1989, there are now several ongoing clinical trials.[52–55]

Principles of Gene Therapy

In principle, gene therapy is relatively simple. By definition, a genetic abnormality can be corrected by inserting the "therapeutic" gene into the somatic cell with its "missing" or "bad" gene construct. Important steps include: (1) the introduction of the gene into the organism; and (2) the expression of the gene. Once the gene/genes responsible for the malignancy are identified, we can, by using molecular biology techniques, replace the malfunctional or "missing" gene. By splicing and rejoining DNA molecules, we can construct tailor-made DNA. These artificial constructs are introduced into a bacterial cell or a suitable vector for multiplication. The desired gene must then be introduced into the target cell.

Three variants of gene therapy are used: (1) gene insertion, which relies on the random insertion of healthy genes into a defective genome to compensate for the damaged version; (2) gene repair, which is based on the repair of the defective gene to restore the genetic code within the cell; and (3) gene surgery, which relies on the excision of the defective portion of a gene and its replacement with its normal counterpart.

Gene insertion is by far the simplest and currently the most favored therapy.[56,57] There are several methods by which the desired gene can be introduced into the target cell. Coprecipitation of the recombinant DNA with calcium phosphate and then its addition to cell cultures is the most commonly used procedure. Microinjection, electroporation and membrane fusion are also available gene delivery methods. Still, the most efficient agents for gene transfer into somatic cells are the viral vectors.[58–60] These vectors have the ability to transduce close to 100% of the target cell.

Applications in Breast Cancer

The therapeutic implications of oncogene research may be even more promising. Our current understanding of oncogenesis suggests two therapeutic modalities. The first depends on the unique structure of oncogenes and the proteins they encode. What distinguishes most of the oncogenes from their corresponding proto-oncogenes is a rearrangement of nucleotide base pairs of the DNA. This scrambling of the genetic code produces proteins whose make-up is distinct from those encoded by normal genes. Clearly, one goal is to develop antagonists that recognize and destroy these. Instead of trying to manipulate cancer cells, removal of the oncogene itself could destroy the

tumorigenic cascade. The second therapeutic route is more speculative. All cell growth depends upon exposure to growth stimulating factors (EGF, PDGF, FGF, etc.). Complementary growth-retarding factors may also be active for inhibition when its continuation becomes unavailable. Identification and control of the "anti-oncogene" may be a key to future treatment.[61–63]

Breast cancers that express estrogen receptors that are responsive to anti-estrogen treatment have a better prognosis than estrogen-negative tumors. Transection of human estrogen receptors into estrogen receptor-negative tumor cell lines is a potential therapeutic approach with good results in animal models. In other studies, viral vectors that contained the human IL-2 gene were used to transduce animal tumor lines with a favorable anti-tumor response.[64–67]

Certain molecular events recently have been identified that cause the initiation and progression of human breast cancer. Over the last year it has become increasingly evident that we will soon possess a powerful armamentarium for the genetic diagnosis of patients with great risk for developing breast cancer, or even the diagnosis of breast cancer in early preclinical stages.

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Postmenopausal Estrogen Replacement Therapy in the Patient with Breast Carcinoma

Michele G. Cyr, MD

Estrogen replacement therapy is prescribed for two indications at the time of menopause. The first is to treat symptoms related to menopause... The second reason . . . is for the prevention of osteoporosis and heart disease.

Listed among the contraindications to estrogen use is a personal history of breast cancer. In fact, until recently, there would be little, if any, reason to approach this topic with anything more than a very clear warning that estrogen should not be used in breast cancer survivors under any circumstances. This warning has become increasingly controversial in several published reviews of the literature that reflect the increasing evidence of hormone replacement therapy's benefit and the growing concern that a large number of women are being denied access to these potential benefits.[1-5] The major argument is that if there is no clearly established increased risk of treatment, then many women are being excluded from the benefits of hormone replacement therapy unnecessarily.

Scope of the Problem

About 175,000 new breast cancers are diagnosed in the US each year. Of these 67% will survive. Between 75% and 90% of these patients will be post-menopausal and 10% to 25% will still be in their reproductive years. Of those younger women treated for breast cancer, many will have menopause induced by treatment with chemotherapy.[1] For these women, the vasomotor and genitourinary symptoms of menopause are likely to be particularly severe because of the precipitous drop in estrogen levels. Also, their earlier menopause will put them at increased risk for osteoporosis and heart disease as compared to women who undergo natural menopause later in life.

For all women who have survived breast cancer and particularly for those who have had menopause prematurely induced by treatment, it is crucial to know the risk of estrogen replacement therapy since the benefits for both symptom control and prevention of long term consequences of menopause could be great.

Tumor Promotion vs Growth

If a causal relationship does exist between estrogen and breast cancer, the possible mechanisms of causation include tumor promotion (initiating normal cells and transforming initiated cells to cancer cells) or tumor growth (causing proliferation of already cancerous cells). This is an important distinction for patients with treated breast cancer, since the risks associated with estrogen therapy could be very different depending on the mechanism of causation. Most of the published literature focuses on the question of estrogen's ability to stimulate tumor growth. The concern has been that if micrometastases are present, then estrogen could potentially activate these and cause relapse of breast cancer. This is important both for short-term symptom control and long-term prevention of complications.

If estrogen can cause tumor promotion, it raises the possibility of initiating a second breast cancer in individuals who already have an increased risk of subsequent breast cancer. The annual incidence of new primary breast cancers is 14 per 1,000 in the population of breast cancer survivors as opposed to 2 per 1,000 in the general population.[1] While short term treatment of symptoms might be safe, long-term treatment to prevent osteoporosis and heart disease could increase the risk for a second cancer. Most of the literature supports a stronger relationship between breast cancer and estrogen with longer duration of use.[6] Although we are far from understanding whether a causal relationship exists between breast cancer and estrogen, as more data become available, it will be essential to ascertain the exact mechanism of the relationship as it will inevitably have bearing on the situations in which estrogen could be prescribed.

Other Cancers

In assessing the risk of estrogen treatment in breast cancer survivors, it should also be acknowledged that other related cancers could be initiated or stimulated by estrogen therapy. Of particular concern are cancers of the ovaries, endometrium, and possibly cervix. At the annual meeting of the Society of Gynecologic Oncologists, researchers presented evidence for a link between breast cancer and gynecologic cancers of the ovary, cervix and endometrium.[7] This preliminary data might suggest the possibility of yet another risk of estrogen treatment in survivors of breast cancer.

There is growing evidence that estrogen replacement may be safe in patients treated for endometrial cancer.[5] Although the definitive study has not been done, many patients with treated endometrial cancer are currently receiving estrogen. The question of initiating other estrogen sensitive primary tumors has not been addressed. This is an area that warrants increased attention.

Treatment vs Prevention

Estrogen replacement therapy is prescribed for two indications at the time of menopause. The first is to treat symptoms related to menopause, including hot flashes and genitourinary symptoms. The second reason to prescribe estrogen at menopause is to prevent osteoporosis and heart disease.

Thus far, there has been a tendency to pose the question about estrogen therapy in breast cancer survivors as if all postmenopausal estrogen treatment were equivalent. Clearly, the goals of therapy will determine the dose, duration, and possible route of treatment, which in turn could significantly affect the safety of treatment.

These two very different indicators for estrogen therapy determine both the dose and duration of therapy. In general, to treat menopausal symptoms, the lowest effective dose of estrogen is prescribed. Hot flashes usually require short-term estrogen therapy since most women have the symptom for less than 5 years after their last menstrual period. Vaginal dryness develops later in the course of natural menopause and may too respond to a shorter duration of estrogen therapy with alternative therapies used for maintenance.

However, to prevent osteoporosis and heart disease, therapy should be long-term, perhaps life-long. Currently, there are no good data to support the use of lower dose estrogen for either heart disease or osteoporosis prevention although studies are now being conducted to address this. Therefore, at this time, if a woman begins estro-

ABBREVIATIONS USED
HRT: Hormonal replacement therapy
LDL: Low density lipoprotein
PEPI: Post-menopausal Estrogen/ Progestin Interventions (Trial)

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gen therapy to prevent these conditions, she is committing to long-term, usual-dose treatment until more data are available.

The literature supports the notion that shorter term estrogen treatment for patients without a history of breast cancer causes no increased risk for breast cancer.[6,8] The pooled results of 16 studies demonstrated that the risk of breast cancer did not increase until 5 years of treatment and there was a 30% increase in breast cancer risk after 15 years of use.[8] There are also some data to suggest that higher dose estrogen increased the relative risk of breast cancer compared with lower dose estrogen.[10] Although these data are derived from women with no history of breast cancer, it is reasonable to assume that similar and possibly accentuated trends might be seen in breast cancer survivors. This, however, remains to be proven.

If shorter term, lower dose estrogen were established to be safe in breast cancer patients, then menopausal symptom treatment with estrogen could be possible. The safety of treating with estrogen to prevent osteoporosis and heart disease would need to be addressed separately since there is still no evidence that lower dose, shorter term estrogen therapy is effective treatment for these conditions.

HRT for Women Without History of Breast Cancer

Much of the literature calling for reevaluation of the use of estrogen in breast cancer patients implies that estrogen replacement is the standard of care for all other women. It is not. Grady et al presented a thorough and cogent analysis of the available data on risks and benefits of hormone replacement therapy and applied the calculated relative risks of associated conditions to specific case scenanos.[6] They concluded that HRT should be recommended to women with hysterectomy and with coronary heart disease or at high risk of coronary heart disease. For all other women, the benefit did not clearly outweigh the risk of therapy.

There has been a concern on the part of many that hormone replacement therapy is being prescribed without a clear assessment of individual risks and benefits.[11] The Women's Health Initiative has been designed to provide data that will distinguish real from potential benefits in subsets of women.[12]

Estrogen in Breast Cancer Patients

To date, there have been few trials of estrogen replacement treatment in breast cancer patients. Many who advocate the use of estrogen in such patients point to the natural experiments of estrogen exposure in patients with breast cancer. One natural experiment is in patients who have become pregnant after treatment for breast cancer. For these patients, there has been no demonstrably adverse effect of pregnancy on their breast cancer.[1] There also is evidence from cohort studies that estrogen treatment before breast cancer diagnosis may improve prognosis,[13] similar to the observation that women who develop breast cancer while taking oral contraceptives have no worse prognosis and in some studies have had better differentiated tumors than women not taking contraceptives.[1]

There have only been three published series of estrogen use in breast cancer survivors to date.[14–16] Stoll treated breast cancer survivors with estrogen for hot flashes and reported that there were no relapses after 2 years.[14] Wile et al studied 25 breast cancer survivors treated with hormone replacement therapy for menopausal symptoms. After an average of nearly 3 years of treatment, three patients had relapsed. The overall survival of the high risk patients was 94%. While their study did not have sufficient power to establish safety of hormonal therapy in breast cancer patients, the authors used their results to justify further investigation.[15] Eden et al have conducted a case-control trial of hormone replacement therapy for menopausal symptoms. There were fewer tumor recurrences in the treated group than among the controls.[1,16]

Other trials are in progress and data should be available in the near future. There is nothing yet to substantiate the harmful effects of short-term estrogen replacement therapy in breast cancer survivors.

Estrogen and Progestin

It is now clear that progesterone must be added to estrogen therapy for women with intact uteri. While it has been known for some time that unopposed estrogen increases the risk of endometrial cancer, the recently published results of the PEPI Trial not only reinforced this association but accentuated it.[17] The addition of progesterone eliminates the observed excess risk from estrogen use.

Consequently, progesterone has become a near mandatory addition to postmenopausal hormonal replacement therapy for non-hysterectomized women, and therefore, estrogen treatment must be considered in the context of progesterone treatment. In the mid to late 1980s, there was some suggestion in the literature that progesterone exerted a protective effect on the risk of breast cancer. However, a careful review of the available data refuted this conclusion.[18] The results from subsequent studies evaluating breast cancer risk from estrogen and progestin have been conflicting.[6] This variability in the published results prevents any firm conclusion from being reached.

There is some *in vitro* support for a possible link between breast cancer and progestin. The mitotic activity of breast cells is higher during the luteal phase than the follicular phase of the menstrual cycle, suggesting that estrogen and progesterone in combination may increase the risk of breast cancer over that of estrogen alone.[13]

The possibility that progesterone could increase breast cancer risk would certainly dampen the enthusiasm for hormone replacement therapy especially since there has been ongoing concern that progestins might attenuate or eliminate the cardiovaseular benefit of estrogen. That concern should become less of an issue with the findings of the PEPI Trial that support the positive effects of estrogen and progesterone on lipid profiles. The most benefit was derived from unopposed estrogen, but estrogen in combination with micronized progesterone showed similar but somewhat less substantial changes.[17] Even as the benefits of progesterone become more obvious, the risks of progesterone remain uncertain. For the breast cancer patient, even a small increase in risk may be unacceptable.

Tamoxifen

Tamoxifen has been shown to be effective in controlling breast cancer. In fact, Tamoxifen's classification as an antiestrogen has been invoked to argue that if it is beneficial for breast cancer, then estrogen must be detrimental. This argument is far too simplistic, however, since Tamoxifen has complex actions that are not uniformly antiestrogen. Tamoxifen has been shown to act like estrogen in increasing the risk of endometrial cancer, improving lipid profile (decreased total and LDL cholesterol) and maintaining bone mass.[1,3] Tamoxifen presumably acts as an estrogen agonist and increases in estrogen levels have been observed with treatment. Premenopausal women treated with Tamoxifen are hyperestrogenic, yet have benefitted from treatment.[1]

It is plausible that Tamoxifen's effect on breast cancer is not solely related to its antiestrogenic actions. There is growing interest in the possibility of concomitant use of Tamoxifen and estrogen in patients who have had breast cancer. This combination is particularly appealing for patients who have symptoms of estrogen deficiency with Tamoxifen use. To date, there have been no well-controlled trials substantiating the benefit and safety of such regimens although there are suggestive reports from Great Britain.[1] Because both Tamoxifen and estrogen increase the risk of endometrial cancer, progestins must be given concomitantly in patients with intact uteri. Certainly this is an area where further study is needed.

Alternatives to Estrogen Therapy

Although some of the literature would imply otherwise, there are alternatives to estrogen therapy for both the treatment of

menopausal symptoms and the prevention of the associated long-term conditions. While it is very true that estrogen is highly effective for the treatment of hot flashes and vaginal dryness, it is by no means the only effective treatment. Similarly, there are alternatives to estrogen for the prevention of osteoporosis and heart disease. Particularly for patients with breast cancer, these alternative therapies may be the only viable choices for symptom relief and prevention of the associated conditions.

Because there are relatively few controlled trials of treatment for hot flashes, much of the information that is available is anecdotal. However, there is information to suggest that Clonidine, Lofexidine, Veralipride, and Sotalol can decrease hot flashes.[19] While none of these completely eliminate hot flashes and their use may be limited by side effects, women who choose not to take estrogen may find these effective.

The safety of the vitamin E in low doses (100-400 IU per day) makes this a reasonable first line treatment for hot flashes. Although the data on vitamin E and hot flashes is mostly anecdotal, there are claims that up to two-thirds of women will experience a relief from hot flashes with vitamin E. Ginseng has been promoted as a "natural" treatment for menopausal symptoms. Ginseng is an herbal source of estrogen and, as such, should be used only in circumstances where estrogen would be prescribed. While it is likely that the amount of estrogen ingested in the form of ginseng is less than what would be prescribed, this is not guaranteed. Other herbs have been touted as effective in the treatment of menopausal symptoms, but clear evidence is lacking.

Preventive strategies can be very effective for women who can identify triggers of hot flashes. Also, paced breathing and relaxation techniques can be used to abort a hot flash at its outset. Unfortunately, these techniques may be less helpful for nighttime hot flashes that can cause night sweats and severe sleep disturbances.

Low dose megestrol acetate has been shown to reduce hot flashes by 85% versus an observed 25% reduction in the placebo group. This treatment could have great promise for women with breast cancer if its long-term safety is established.[20] It is not yet known whether megestrol affects hormonally sensitive cancers such as breast cancer and cannot yet be recommended with confidence as an alternative to estrogen therapy for hot flashes in breast cancer patients.

Post-menopausal genitourinary atrophy can cause symptoms of vaginal dryness, dyspareunia, dysuria, and urinary incontinence. While estrogen is highly effective in reversing the atrophic changes, there are other means of prevention and treatment. Continued sexual activity prevents some of the postmenopausal changes by mucosal stimulation. For women who have established symptoms of vaginal atrophy a short course of estrogen (topically or systematically) may be necessary so that they can resume sexual activity to prevent ongoing and progressive problems. There are now topical treatments that contain a mucoadherent compound, polycarbophil, are superior to conventional lubricants, and are effective for several days after a single application.[19] These can be very effective for women who cannot use estrogen.

Estrogen is certainly not the only effective means of preventing osteoporosis and heart disease. Weight-bearing exercise and calcium both have important roles in osteoporosis prevention. Other treatments are being actively investigated as well. Diet, exercise, and smoking cessation are effective in reducing the risk of heart disease. These strategies should all be employed whether estrogen is or is not recommended. For most women, these life style changes will have additional health benefits.

The Final Decision

While there is currently no substantiation that estrogen therapy is detrimental to the postmenopausal breast cancer survivor, there is also no substantiation that it is safe. Until more data are available, it is likely that physicians' practice will vary depending on their bias with regard to the relative risks and benefits of hormone replacement therapy. Some clinicians have reported the use of estrogen therapy for the treatment of menopausal symptoms in patients with a history of breast cancer.[21,22] More cautious physicians are likely to withhold estrogen treatment for their breast cancer patients until its safety is established. In any case, it is clear that there is a definite role for the alternatives to estrogen therapy both for symptom control and prevention.

Ultimately, it is not the physician but the patient who will decide what risk is acceptable to justify the benefit of treatment. Women who have had breast cancer have faced life-threatening illness and are likely to have well-formulated opinions about quality of life and acceptance of risk. Their beliefs and values will guide the decision-making process in the context of the available data. Fortunately, there are an ever-expanding number of resources available to peri-menopausal women who are facing similar decisions.[23] It is also likely that we will have more data available in the not too distant future since there are already trials in progress and the National Cancer Institute is currently reviewing proposals to investigate the use of hormone replacement therapy in menopausal breast cancer survivors. Meanwhile, we must continue to work with our patients to better understand their individual needs to maximize the potential for good and minimize the potential for harm.

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Psychosocial Needs of Breast Cancer Patients in RI

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We examined the effect of sociodemographic, treatment and psychosocial factors on levels of emotional distress in breast cancer patients.

It is not surprising that many breast cancer patients experience high levels of psychosocial morbidity. Receiving a diagnosis of breast cancer, a potentially life-threatening illness, is itself directly associated with the fear of death and an uncertain future for most women. Additionally, increased levels of anxiety and depression can be produced indirectly by disrupted family relationships, changed role responsibilities and financial hardships, all of which may be experienced as a result of breast cancer therapy. The possible consequences of treatment itself, including altered body image/sexuality, side-effects, functional limitations and unmet practical needs, can also lead to elevated levels of emotional distress. A review of the literature on psychosocial adjustment reveals that women with breast cancer experience higher emotional distress than patients with other medical conditions, and that greater levels of anxiety and depression have been observed at one and two years post-diagnosis.[1] Previous research has also shown that younger breast cancer patients experience higher psychosocial morbidity than their older counterparts,[2] but that the availability of social support from significant others can facilitate better emotional adjustment regardless of age.[3]

The purpose of this paper is to describe the psychosocial status of recently diagnosed breast cancer patients in Rhode Island. We examine a variety of sociodemographic, treatment and psychosocial factors by age to identify differences in the breast cancer experience for younger and older women, and then determine whether these variables are related to emotional distress. We also discuss the benefits of support groups in mitigating emotional distress, and provide a comprehensive listing of support services in Rhode Island for women with breast cancer.

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Methods

Research Design

The data presented in this paper were collected in Phase I of a study being conducted by the Brown University Center for Gerontology and Health Care Research with funding from the National Cancer Institute. The main goal of this research project is to increase the proportion of older women with early stage breast cancer who receive post-operative treatment. The first phase of this study was designed to investigate the individual, family, physician and institutional factors affecting the likelihood that patients would receive adjuvant treatment. Face-to-face interviews were conducted by trained clinical research nurses in order to elicit detailed information on a wide range of factors related to the breast cancer experience, including the diagnostic process, physician relationships, surgical and adjuvant treatment recommendations, patient decision-making, follow-up care, current physical and emotional health status, and social support. The information obtained from these one to two-hour interviews was used to refine patient- and hospital-based interventions which are currently being tested. This second phase of the study will be completed early in 1997.

Sample

A convenience sample was obtained through the offices of 36 surgeons practicing in the state of Rhode Island who agreed to participate in the study. Breast cancer patients who were over the age of 30 with stage 0-IIIA tumors and diagnosed approximately three months to one year earlier than the date of consent were eligible to participate. A total of 261 breast cancer patients were referred to the study over a one year period. Recruitment procedures included advance written notification by the surgeon of study involvement and patient referral, a letter from Brown providing additional information about the research, and a follow-up telephone call to answer questions and invite participation. Of the patients referred to the study, 69.4% consented to participate and were interviewed, 13.0% declined participation, 12.6% were determined to be ineligible post-referral, and 5.0% were unreachable, yielding an overall participation rate of 84.2%. Refusers were more likely to be aged 55 and older.

Measures

The outcome variable of interest in this paper is emotional health as measured by the Mental Health Inventory (MHI-5), a five-item sub-scale of the Medical Outcomes Study 36-Item Short-Form General Health Survey (SF-36) (see Table 2). The MHI-5 includes items from four major mental health dimensions: anxiety, depression, loss of behavioral/emotional control, and psychological well-being. The construct and predictive validity of this index has been rigorously tested. The MHI-5 correlates highly with longer mental health scales, such as the MHI-38, and is able to predict a variety of psychosocial-related outcomes, such as depression and utilization of mental health services. Due to its ease of implementation and demonstrated reliability, the MHI-5 is widely utilized in health related research.[4-6]

We examined the effect of sociodemographic, treatment and psychosocial factors on levels of emotional distress in breast cancer patients. Sociodemographic characteristics included age, marital status, living arrangement, and level of education. (Race was not included because nearly all respondents were white.) Treatment measures included time since diagnosis, stage of disease, final surgery, adjuvant therapy, number of doctors involved in treatment and level of pain in the past week. Psychosocial factors included the existence of marital, family, work-related, financial and/or medical problems at time of diagnosis; receiving strong social support; receiving strong practical support; support group attendance;

ABBREVIATIONS USED

MHI-5: 5-Item Mental Health Inventory

MHI-38: 38-Item Mental Health Inventory

SF-36: Medical Outcomes Study 36-Item Short-Form General Health Survey

and the "biggest problems [the patient] had to deal with because of [her] breast disease." Open-ended responses for the latter item were coded into the following categories: no problems, physical consequences of treatment, emotional difficulties and other (including problems with decision-making, family or friends, body image, work, finances, and transportation). Strong social support was defined as having contact at least once a week with someone with whom the patient can speak about "personal feelings, worries, or hopes," and strong practical support was defined as having contact at least once a week with someone to whom the patient can turn for practical assistance.

Analytic Approach

Since previous research has shown that age is significantly related to differences in treatment type,[7] levels of unmet need, and psychosocial adjustment among breast cancer patients,[2,8,9] we first examine sociodemographic, treatment and psychosocial factors by age. The age groups of <55 and 55+ years were selected because these ages correspond not only with physical changes marked by the onset of menopause, but also with family and social role transformations related to caregiving, childrearing and employment activities. Using analysis of variance, we then examine whether emotional well-being, as measured by the MHI-5, is related to the sociodemographic, treatment and psychosocial characteristics of breast cancer patients.

Results

Sample Description

Table 1 describes the sample with respect to sociodemographic, treatment and psychosocial factors by age. We interviewed patients as soon as possible after they consented to participate in the study, but older patients were slightly more likely to be interviewed within six months of their diagnosis. Breast cancer patients under the age of 55 were significantly more likely to be married (74.6% vs 52.6%) and to live with children (83.0% vs 29.2%) than were those aged 55 and over. Conversely, older patients were more likely to live alone (37.1% vs 12.7%). Younger patients were more likely to have attended some college than were older women (61.9% vs 29.3%). In this nonrandom sample, older patients were more likely to be diagnosed with stage 0 or I breast carcinomas than younger patients (70.3% vs 49.1%). There were no age differences in the receipt of breast conserving surgery (66.3%) or radiation therapy (64.8%; data not shown). As might be expected, younger women were more likely to have undergone chemotherapy (66.7% vs 17.2%), while a greater proportion of older women received hormonal therapy (60.3% vs 27.0%). Patients under the age of 55 had more doctors involved in their treatment, with 69.8% having three or more physicians compared to only 36.2% of those aged 55 or older. There were no age differences in the current level of pain reported by patients, however over one-half indicated feeling some discomfort.

Table 1.—Sample Description by Age

	< 55 (N = 63) %	55 + (N = 116) %
Interview took place <6 months after biopsy *	22.2	41.4
Married **	74.6	52.6
Lives with children ***	83.0	29.2
Lives alone ***	12.7	37.1
Some college education ***	61.9	29.3
Stage 0 or I **	49.1	70.3
Lumpectomy	67.7	65.5
Adjuvant treatment:		
chemotherapy ***	66.7	17.2
radiation therapy	69.8	62.1
hormonal therapy ***	27.0	60.3
Three or more doctors involved in treatment ***	69.8	36.2
Pain (during the past week):		
none	38.1	44.8
mild	46.0	36.2
moderate/severe	15.9	19.0
Other problems at time of diagnosis:		
marital or partner problems **	17.7	3.1
work-related problems ***	26.7	3.3
financial problems ***	25.4	6.0
medical problems *	30.6	46.6
Strong social support	77.8	73.3
Strong practical support	73.0	75.9
Biggest problem related to breast cancer: ***		
none	3.2	25.4
physical	27.0	38.6
emotional	44.4	21.1
Attended support group ***	30.2	10.3

* p<.05
** p<.01
*** p<.001

Over 70% of patients report they were dealing with at least one other problem at the time of their breast cancer diagnosis. Younger patients were more likely to experience spouse/partner (17.7% vs 3.1%), work-related (26.7% vs 3.3%) and financial difficulties (25.4% vs 6.0%), while a greater proportion of older patients were coping with other medical problems (46.6% vs 30.6%). Younger and older patients did not significantly differ with respect to family problems nor with having someone close to them with medical problems. On average, patients under the age of 55 encountered a greater variety of problems at the time of diagnosis than did their older counterparts. However, there were no age differences in the reported availability of persons to whom patients could turn for emotional and practical support. When asked what were "the biggest problems you have had to deal with because of your breast disease", more older than younger patients responded that they had no problems (25.4% vs 3.2%). Patients aged 55 and over were also more likely to identify the physical consequences of treatment, including both complications of surgery and side-effects of adjuvant therapies, as the greatest difficulty related to having breast cancer. Patients under the age of 55 mentioned emotional issues, such as lack of family support and fear of recurrence, more frequently than older patients. Nonetheless 21.1% of older women also reported that the biggest problem they had to deal with was an emotional issue incident to their breast cancer, suggesting that not only younger women experience these problems. In light of the prevalence of emotional problems in the sample, it is surprising that only 17.3% of patients attended a support group, with younger patients three times more likely to do so than their older counterparts (30.2% vs 10.3%).

Emotional Health

Table 2 presents the items that make up the MHI-5 and displays the proportion of patients under and over age 55 who responded all or most of the time to the individual scale items, as well as the mean composite weighted index score for each group. Other responses to these items include: some, a good bit, a little and none of the time. The range of the MHI-5 for this sample is 22.4 to 94.5, with higher scores indicating better emotional health. Emotional distress as measured by this scale is

Table 2.—Mental Health Index (MHI-5) by Age		
How much time during the last month have you . . . (% responding all or most of the time)	< 55 (N=63)	55+ (N=116)
been a very nervous person?	9.5	12.9
felt so down in the dumps that nothing could cheer you up?	1.6	4.3
felt calm and peaceful? *	28.6	44.0
felt down-hearted and blue?	4.8	5.2
been a happy person?	55.6	69.8
Mean composite weighted index (mean ± sd):	70.6±13.9	73.2±15.1

* p<.05
** p<.01
*** p<.001

manifest among both younger and older patients, with only 38.5% indicating that they "felt calm and peaceful" all or most of the time during the month prior to the interview. However, older patients were significantly more likely than their younger counterparts to respond all or most of the time to this item (44.0% vs 28.6%). Overall, there were no measurable differences in level of emotional distress for older and younger patients in this sample.

We also examined the relationship of other sociodemographic, treatment and psychosocial measures to the dependent variable of interest—emotional health—and found few significant relationships. Table 3 presents the mean scores for those factors that were significantly related to emotional health. Regardless of age, patients who had other problems at the time of diagnosis—marital, family, work, financial or medical—had higher levels of emotional distress. MHI-5 scores became worse (decreased) as the number of pre-existing problem areas increased. Pain was also significantly related to level of emotional distress. Patients without pain had MHI-5 scores that were 10 points better than those with mild pain, and 20 points higher than those with severe pain. However, having strong social support (73.6 ± 13.4) or strong practical support (74.0 ± 13.4) were associated with better emotional health, regardless of age.

Although age and living alone were not independently associated with increased levels of emotional distress, two way interactions controlling for age revealed that younger patients who live alone were significantly more likely to experience psychosocial morbidity than older patients residing by themselves (60.4 vs 73.9; p<.05). These data also suggest that unmarried women in the younger age group experience greater emotional distress than those aged 55+ (64.5 vs 72.3; NS; data not shown).

Discussion

Overall, the breast cancer patients participating in this study experienced levels of emotional distress that are comparable to those reported by similar women in earlier studies, regardless of age or time since diagnosis. Since the MHI-5 has been used in numerous other studies, we can compare the scores for our sample with other patient populations to better understand their meaning. The average score for our sample was 72.3. In the Medical Outcomes Study, a national sample of women being treated by medical providers had a mean score of 73.2 whereas women being treated by mental health professionals had a mean score of 53.5. It is clear that patients in this sample are experiencing levels of emotional distress that are comparable to women with other medical conditions, although substantially lower than women being treated for depression. Patient responses regarding the biggest problem associated with having breast cancer help illustrate the wide range of emotional difficulties:

"Nothing feels comfortable anymore."
"I have pressure from my employer to return to work."
"I worry about my children and how this will affect them."
"I am concerned about my daughter and her daughter one day getting breast cancer."
"I'm afraid to go out now because of the way I look. I feel like everybody can tell."
"I don't want it to come back—I think about it all the time."
"I am very concerned about my other breast."
"It made me very afraid."

While both age groups reported emotional distress in our sample, experiences were somewhat different for younger and older women. At an earlier stage in the life course, younger patients have greater potential to encounter multiple other problems, such as relationship, family, work and financial difficulties, which further complicate already difficult treatment decisions and processes. As younger patients are more frequently married (74.6% vs 52.6%) and with children residing in the household (83.0% vs 29.2%), illness can have a profound impact on the entire family. Husbands must not only cope with the fear of losing a spouse, but also take on the unfamiliar burden of household and caregiving responsibilities, which may cause stress in the relationship. Younger patients with children are also confronted daily with a variety of concerns, including what to tell children about, as well as how children will react to, their illness. Many mothers realistically worry that they will not live to see their children grow up, or that their daughters will one day get breast cancer. Additionally, many younger patients who are employed outside the home must stop work during treatment, which may cause financial hardships for the family, as well as concerns about being fired or losing health benefits.

Furthermore, younger women with breast cancer more frequently receive chemotherapy. In this sample, women aged <55 were almost four times as likely to undergo this type of therapy than their older counterparts. A highly toxic form of treatment,

Table 3.—Factors Associated with Patients' Emotional Health for Total Sample (N=179; mean ±sd)	
Total Sample	72.2 ± 14.7
Factors associated with higher emotional distress:	
Work-related problems at time of diagnosis *	64.8 ± 17.0
Financial problems at time of diagnosis **	63.4 ± 16.3
Number of problem areas at time of diagnosis: *	
four	59.4 ± 18.9
three	66.9 ± 13.6
two	69.8 ± 13.5
one	73.8 ± 15.3
none	75.4 ± 12.9
Pain: ***	
severe	58.5 ± 15.5
moderate	67.6 ± 16.2
mild	68.6 ± 14.9
none	78.1 ± 11.7
Factors associated with lower emotional distress:	
High social support *	73.6 ± 13.4
High practical support **	74.0 ± 13.4

* p<.05
** p<.01
*** p<.001

chemotherapy can involve more psychologically and physically disabling side-effects than experienced with hormonal treatment (which is twice as likely among women aged 55+). For example, hair loss, nausea and vomiting, extreme fatigue and water retention are all common side-effects of chemotherapy. Hair loss, as an outward manifestation of the illness within, is an especially traumatic experience for younger women, even more so in many cases than the loss of a breast.

Older breast cancer patients also experience emotional distress. However, being diagnosed with breast cancer later in the life course may represent a somewhat different experience. While patients aged 55 and over are more likely to have other medical difficulties (46.6% vs 30.6%), they report fewer other problems at the time of diagnosis. A greater proportion of older women live alone (37.1% vs 12.7%), and therefore, are less likely to encounter the types of marital or family problems more commonly faced by younger women. Additionally, women aged 55+ are less often employed and, as a result, are not exposed to the extra burden of having to confront co-workers or worrying about the loss of income. Older patients also have some advantage in that they are guaranteed health benefits through Medicare. Furthermore, being diagnosed with breast cancer may be less of a shock for older women, especially if they have already had to deal with other health problems.

Although we tried to identify factors which intensified or mitigated levels of emotional distress for this sample of breast cancer patients, few were found. Having other problems at the time of diagnosis, especially in work-related and financial areas, was significantly related to emotional distress following treatment. The level of emotional distress was also observed to increase with the total number of problems encountered. In fact, patients with problems in four areas had MHI-5 scores which were 16 points lower than those with no difficulties; this score was nearly as low as the average for a national sample of women being treated by mental health providers. Although the diagnosis of breast cancer may focus the patient's physical and mental energy on treatment and recovery, pre-existing problems may hinder the patient's adjustment to and emotional recovery from the disease. The existence of other problems at the time of diagnosis could be used by providers to identify subgroups of women who might be vulnerable to greater emotional distress. Once identified, these patients could be encouraged to obtain appropriate support services.

Our data also suggest that younger patients who live alone and/or are not married may be at risk of increased emotional distress. For instance, younger women who reside by themselves had MHI-5 scores which were 13 points lower than their older counterparts. It is possible that women over the age of 55, who are significantly more likely to be unmarried and live by themselves, are more accustomed to dealing with medical problems alone. On the other hand, younger women who are single and living alone may be upset by the realization that certain life goals, such as getting married, having children and/or pursuing a career, must be put on hold, or possibly go unfulfilled, as a result of having breast cancer.

Physical pain was also associated with greater levels of emotional distress, with MHI-5 scores varying by 20 points from patients with no pain to those with severe pain. The pain may prevent patients from resuming their normal activities and result in greater emotional distress. Additionally, many women associate pain with the presence of the disease. Experiencing discomfort may not only remind patients that they have breast cancer, but may also generate fears of spread or recurrence. Educating patients about the realities of pain may help to alleviate unnecessary anxiety. If pain can be relieved through medical or nonmedical interventions, patients may benefit emotionally as well as physically.

Perceived strong social and practical support mitigated emotional distress among patients, regardless of age. Having regular contact with someone to whom the patient can speak about "personal feelings, worries and hopes" may help the patient adjust to her diagnosis. The ongoing social support may provide encouragement and help the patient solve problems as they arise. Similarly, perceived practical support may reduce the anxiety associated with having to meet practical needs such as transportation, shopping, cooking, laundry, etc. during treatment and recovery.

When asked, "how the doctors and other health care professionals could have helped you more", respondents most frequently indicated that they would have appreciated "more support". Several participants mentioned that just being able to talk through the experience with the research nurses during the study interview helped to sort out their feelings about their breast cancer diagnosis and treatment. In some cases, this was the first opportunity they had had to do so since being diagnosed. Many patients wished that they had been referred to a support group; they suggested that being able to "talk to other women who have gone through it" would have been helpful. They felt that learning from the experience of others and knowing what to expect would have alleviated some of their uncertainty and fear.

However, while many breast cancer patients recognize the benefits of receiving social support, especially from other women with similar experiences, most patients do not utilize formal support services. Only 17.3% of patients in this sample reported attending a support group, and these were mostly younger women. However, a large majority of patients who did utilize support services felt that they were either very (67.7%) or somewhat (19.4%) helpful. Since patients are often uncertain how to obtain information about support groups or are unaware that they even exist, it is important that providers initiate conversations about these services as soon after the diagnosis as possible. The simple act of informing patients that support services are available and supplying them with an up-to-date list of resources expands the otherwise limited opportunity for interested women to seek out emotional support. A listing of support services currently available to breast cancer patients in Rhode Island is provided in the Appendix. The names and telephone numbers of persons who can be contacted at this time for additional information have also been included for the reader's convenience.

Support groups may not be the answer for everyone. Older women are often uncomfortable talking about their breast cancer in a group setting, or frequently have transportation difficulties getting to and from meetings. These patients may benefit more from one-on-one interaction, whether in person or over the telephone. Professional counseling may be an appropriate referral for some patients; organizers of support groups can make referrals to these services as well. In some offices, physicians make special efforts to introduce women who have completed their treatment to newly diagnosed patients of a similar age. More seasoned patients can offer empathy and practical advice based on their own experiences. Some of the breast cancer patients we interviewed indicated that they "would love to volunteer to talk to other women with breast cancer" or want to provide "support and information to others facing the same thing." This type of interaction can benefit both patients.

Conclusion

This study shows that emotional distress among breast cancer patients is high in the first year after their diagnosis, but is not on average as high as that evidenced by women undergoing treatment for depression. The initial shock of diagnosis is quickly replaced by the stress of making treatment

Appendix: Support Services for Breast Cancer Patients A. Hospitals:			
Hospital/Sponsor		**Description**	**Contact/Phone Number**
Kent County Memorial Hospital	I Can Cope	A series of educational classes for people with cancer, their families, and friends. Designed to help people experiencing cancer understand and cope with their feelings.	Joanne Sullivan (401) 737-7000 x: 1583 or Linda Kalinoski (ACS) (401) 722-8480
Landmark Medical Center	Breast Cancer Support Group	A support group offered through the HOPE Center for Life Enhancement	Sue Van Ness (401) 454-0404
The Miriam Hospital	Look Good, Feel Better	A program specifically for cancer patients undergoing chemotherapy or radiation treatments. Provides practical information on hair, skin and nail care to help women deal with the temporary side-effects and changes in appearance related to these treatments.	Kathy Higginbotham (401) 331-8500 x: 2078 or Linda Kalinoski (ACS) (401) 722-8480
Newport Hospital	I Can Cope	SAME AS PREVIOUS.	Judy Smith (401) 846-6400 x: 1741 or Linda Kalinoski (ACS) (401) 722-8480
Roger Williams Medical Center	Woman to Woman	An 8-week educational program for women who have undergone breast cancer surgery. Experienced health care professionals talk with women about practical issues and emotional concerns.	Jim Willsey (401) 456-2284
	Open Door	A support group for women with all kinds of cancer. Provides an opportunity to share feelings and concerns, obtain support and receive professional guidance.	
	Take Time	A support group for people with cancer and their families and friends.	
St. Joseph Hospital	Breast Cancer Support Group	An 8 week program offering education and support to women with breast cancer.	Roberta Milam (401) 456-3033
Women & Infants Hospital of RI - Breast Health Center	Breast Cancer Support Group	A 6 week educational workshop for breast cancer patients.	Karen Kazin (401) 453-7540
B. Other Sponsors:			
American Cancer Society (ACS)	Reach to Recovery	A rehabilitation program for breast cancer patients. Trained volunteers, who have also experienced breast cancer, meet with patients one-on-one to discuss the various physical and emotional aspects of recovery. Workshops are also held occasionally for patients and supporters.	Linda Kalinoski (401) 722-8480
Breast Health	Breast Cancer Support Group	A psychotherapist with experience in helping women recover from breast cancer blends traditional psychotherapy with relaxation techniques, guided imagery, education, & support.	Joan McNeil (401)245-9707
HOPE Center for Life Enhancement	Breast Cancer Support Services	Offer a variety of services for breast cancer patients including support groups, informational classes, educational presentations, a resource library and a bi-monthly newsletter.	Sue Van Ness (401) 454-0404
Rhode Island Breast Cancer Coalition	Focus On Us	A peer group offering support during breast cancer treatment and recovery.	Marlene McCarthy (800) 216-1040
	Woman to Woman	SAME AS PREVIOUS.	
Tollgate Surgical Associates	Breast Cancer Support Group	A support group for women who have been diagnosed, or who are being treated for, breast cancer. Surgeons, radiation oncologists, and social workers attend and answer questions. Female support persons are also welcome.	Betty Moretti (401) 739-8010
Y-ME National Breast Cancer Organization	Breast Cancer Hotline	Phones are answered by breast cancer survivors who answer questions, provide information and give support concerning different treatment options.	(800) 221-2141

decisions. During treatment, patients must make compromises and adjustments in their daily functions which may produce anxiety and depression. Once active treatment is over and the frequency of contact with health care providers subsides, many women are left alone to confront fears of recurrence and anxiety about the future. Social support is important at all stages of the breast cancer experience. Other women who have had breast cancer can be extremely valuable sources of practical information and emotional support. However, many patients are unaware of the formal support services that exist in their area. We suggest that physicians keep current information regarding support services and sponsors, and provide this information to breast cancer patients early in treatment. As part of a patient's follow-up care, attention must be given to the emotional issues which the patient continues to face.

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Rhode Island Department of Health
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Edited by Judith Feldman, MD,
John P. Fulton, PhD, and Bela Matyas, MD

Screening for Non-Insulin-Dependent Diabetes: The Issues

John P. Fulton, PhD, and Joann M. Lindenmayer, DVM, MPH

Non-insulin-dependent diabetes mellitus (NIDDM) is a disease of major import. NIDDM accounts for approximately 90% of all diabetes.[1] About 5% of adults over 40 years of age have been diagnosed with NIDDM, and an equal proportion are believed to have the disease, but not to have been diagnosed.[1] The prevalence of NIDDM is higher among Native Americans, Hispanic Americans, and African Americans than among non-Hispanic whites.[1] Diabetes mellitus (DM) causes 50,000 deaths in the US each year.[2] As a cause of death, DM ranks seventh behind diseases of the heart, malignant neoplasms, cerebrovascular diseases, chronic obstructive pulmonary disease, unintentional injuries, and pneumonia and influenza.[2]

Early Intervention

Early identification and treatment of NIDDM has many benefits. Glycemic control reduces the risk of acute decompensation, and alleviates polyuria, polydipsia, fatigue, weight loss with polyphagia, blurred vision, and vaginitis or balanitis.[3] Regular check-ups allow early detection and medical intervention for diabetic retinopathy, nephropathy, neuropathy, hypertension, dyslipidemia, cardiovascular disease, and foot lesions.[3]

Screening

Standards for NIDDM screening are well established.[1] Nonetheless, case finding for NIDDM is practiced unaggressively; about half the prevalent cases are thought to be undiagnosed.[1] An estimated 35,000 cases of NIDDM may be undiagnosed in RI, for example.

Table 1.—Major risk factors for NIDDM

1. Family history of diabetes: parents or siblings with diabetes
2. Obesity: >20% over ideal body weight
3. Race: Native American, Hispanic American, African American
4. Age: >40 years plus any of the preceding factors
5. Previously identified impaired glucose tolerance (IGT)
6. Hypertension or hyperlipidemia: cholesterol ≥240 mg/dl; triglycerides ≥250 mg/dl
7. In women: History of gestational diabetes mellitus or delivery of babies >9 lbs

Screening for NIDDM may not have been pursued aggressively in the past because the rationale for screening NIDDM was not compelling. The known, moderate benefits of early NIDDM detection were offset by a number of factors: The advantages of glycemic control early in the course of the disease were unclear, asymptomatic patients resisted the substantial behavioral changes necessary for achieving unproven benefits, and treatments for complications such as retinopathy were not well developed.

Recent Developments

A number of recent developments have strengthened the rationale for NIDDM screening. Most significantly, the Diabetes Control and Complications Trial (DCCT) demonstrated that tight glycemic control in persons with insulin-dependent diabetes mellitus (IDDM) "delays the onset and slows the progression of diabetic retinopathy, nephropathy, and neuropathy."[4] Since "the relationship between microvascular disease and hyperglycemia" is similar in IDDM and NIDDM, the American Diabetes Association (ADA) concluded that "it is reasonable to employ the same glycohemoglobin and blood glucose goals" in IDDM and NIDDM, "pending the outcomes of clinical trials that are studying the benefits of achieving such goals in NIDDM."[3] Also, treatments for diabetic complications have been improved; if used early in the disease process, they may reduce the risk of adverse outcomes such as myocardial infarction, amputation, blindness, and renal failure. Finally, two new screening tools, developed for use in tandem, may lower the cost of screening and improve its acceptability among persons eligible for screening. One is a short questionnaire to identify risks for NIDDM,[5] the other an enhanced random capillary blood glucose measurement.[6] In sum, the benefits of early NIDDM detection are now believed to be substantial, and new screening tools may facilitate case finding.

The ADA approved a position on screening for NIDDM in 1989, and revised it in 1993.[1] The ADA presents a strong rationale for NIDDM screening in asymptomatic adults, recommending a three-step approach: 1) Identify adults with ≥1 major risk factor for NIDDM (Table 1). 2) Perform a fasting plasma glucose test (no food or beverage other than water for at least 3 hours before testing) or a random plasma glucose test (any food or beverage other than water within 3 hours of testing) on all persons identified in Step 1. 3) Refer persons with fasting plasma glucose levels >115 mg/dl or with random plasma glucose levels >160 mg/dl to physicians for diagnostic testing.[1]

Remaining Issues

Important screening issues remain unresolved. First, the effect of tighter glycemic control on the onset and progression of

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diabetic retinopathy, nephropathy, and neuropathy in persons with NIDDM, although believed to be positive and potentially substantial, remains unknown. The DCCT Research Group warns: "If the main conclusions of this trial with regard to the benefits of reducing glycemia are extended to patients with NIDDM, careful regard for age, capabilities, and coexisting diseases will be necessary. We therefore advise caution in the use of therapies other than diet that are aimed at achieving euglycemia in patients with NIDDM."[4] Second, compliance with behavioral regimens for improving glycemic control in persons with NIDDM may still be problematic, despite the promise they hold for the prevention and delay of diabetic complications. Again, the DCCT Research Group warns: "Intensive therapy was successfully carried out in the present trial by an expert team of diabetologists, nurses, dietitians, and behavioral specialists, and the time, effort, and cost required were considerable. Because the resources needed are not widely available, new strategies are needed to adapt methods of intensive treatment for use in the general community at less cost and effort."[4] Third, the new screening tools described above have not been widely tested, and will require time for full evaluation and (if appropriate) widespread deployment. Fourth, the effectiveness of *mass screening* for NIDDM in preventing or delaying the onset of diabetic complications has not been tested. Unlike case finding, mass screening is not performed in the context of a provider-patient relationship; major barriers exist in the transition between mass screening and the long-term medical follow-up needed to control NIDDM. Mass screening should be piloted to address these barriers.

The Rhode Island Diabetes Control Program (the Program) has received a grant from the Centers for Disease Control and Prevention to study the use of new screening modalities for NIDDM (the risk questionnaire and the enhanced random capillary glucose measurment described above) in primary care practices serving high-risk urban populations. Over the course of a year, the Program will identify all active patients in the practice who are over age 20 and who have not been diagnosed with NIDDM or IDDM, and invite them to be screened. The following parameters of screening will be assessed: sensitivity, specificity, cost, acceptablity, and extent of follow-up. Particular attention will be focussed on identifying barriers to screening and follow-up. For further information on the study, please call the Diabetes Control Program, 401-277-3442.

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THE RHODE ISLAND MEDICAL JOURNAL HERITAGE

90 Years Ago
September 1905

The lead editorial expresses deep concern over the epidemic spread of yellow fever throughout the city of New Orleans. Up until August 15, states the editorial, there have been 1,122 cases and 184 fatalities from this mosquito-borne infection. Despite the recent epidemiological findings of such investigators as Reed, Carroll, Finlay and Gorgas, the city of New Orleans has done little to rid itself of the breeding sites of *Stegomyia fasciata*. The editorial observes: "It is quite a shock to Anglo-Saxon self-complacency to hear, even in jest, that the Cuban Government is to ask for some guarantee from the United States that the sanitation of its gulf ports shall be improved so as not to again menace the health and commercial interests of the island republic. Havana . . . has for four years been free from yellow fever."

Frank Peckham, MD describes the various manifestations and varieties of rheumatoid disease as seen in Providence. In this category he considers such non-tubercular diagnoses as chronic rheumatism, arthritis deformans, chronic rheumatic gout and septic arthritis. The author first dwells upon atrophic arthritis, noting particularly those cases in which the temporomandibular joint is selectively involved. He attempts to distinguish between acute attacks of this disease and true acute rheumatism, a process which is prone to involve, also, the endocardium and cardiac valves. He then explores the many diagnostic features of hypertrophic arthritis and demonstrates a series of five X-rays of the hand with joint deformations as well as atrophic or locally destructive changes in bone. There is no discussion, in depth, of therapy for these disparate conditions although the author declares that "by omission is not meant that nothing can be done."

A case of adenocarcinoma involving the cartilaginous meatus and the squamous and mastoid portions of the temporal bone is presented by Frank Sprague, MD. The patient was a 62 year old woman who sought medical help because of periodic attacks of pain, headaches, and deafness alternating with tinnitus. A pathologic diagnosis of the resected neoplasm surrounding the external auditory meatus was" adenocarcinoma originating in the glands near the parotid." The patient died 8 months postoperatively.

50 Years Ago
September 1945

Elliott P. Joslin, MD is author of a paper entitled, "Newer Developments in the Etiology and Treatment of Diabetes." He first describes the results of his recent survey of the incidence of diabetes in the United States, noting the ubiquity of the disease, particularly in the Arizona nomadic native Americans. He then reflects upon the paradox of insulin allowing diabetic children to survive through adulthood only to die then from the vascular complications of this disease. Diabetes mellitus, he notes, affects over 800,000 Americans and he reminds his readers that one American in four will have a relative with diabetes. He then describes the effects of the newly identified anti-islet chemical, alloxan. Joslin concludes: "The responsibility for the control of diabetes rests today as heretofore largely upon the individual patient but only so, provided the hospital furnishes the beds and laboratory service for his complications and provided the doctors furnish education along with therapy and prompt action whenever an emergency arises."

Carl Binger, MD writes on some newer aspects of psychosomatic medicine. He acknowledges the divergent, often contradictory, beliefs in this aspect of medicine. He concludes: "The pressing demands of military medicine have greatly enhanced the importance of the psychosomatic point of view, as anyone engaged in rehabilitation work will no doubt realize. There is danger that our patients will be subjected to amateurish bungling, meddlesome psychiatry, or on the other hand, to medicine which is slipshod and inexpert. These unhappy alternatives must be avoided by the cooperative efforts of psychiatrists and internists, perhaps eventually by a sounder training in psychiatry for all physicians.

Roger Lee, MD, president elect of the American Medical Association, writes on geriatric medicine and the inevitable increase in the number of elderly within the practice population of most physicians. He notes metaphorically that any machine is better for some use and urges that older people be encouraged to find something to challenge their mental capacities, something which will use their abilities, once they have retired from their jobs. He recalls an old jingle:

King David and King Solomon
Led merry, merry lives,
With many, many lady friends
And many, many wives;
But when old age crept over them-
With many, many qualms,
King Solomon wrote the Proverbs
And King David wrote the Psalms.

John F. Kenney, MD, president of the Rhode Island Medical Society, writes on the doctor's patient and the Wagner Act. And while he advocates prudent legislation to broaden health welfare, he stresses the prime importance of preventive interventions and the role of nutrition in health.

25 Years Ago
September 1970

This issue of the *Journal* is devoted to the question: Can man's lung be replaced temporarily or permanently? It is dedicated to Meyer Saklad, MD for his decades of pioneering effort in pulmonary function and patient care.

The lead article, written by Meyer Saklad, MD, describes on-line monitoring of respiration and the developmernt of the intensive care unit, emphasizing the facilities needed to detect and measure, automatically, these changing pulmonic phenomena.

Ralph Redding, MD discusses the chemistry of the lung emphasizing the surfactants, the vasoactive polypeptides (including bradykinin, histamine and angiotensin II), clotting and anticlotting factors, pulmonary clearance mechanisms, and *in utero* lung function.

David Blumenstock, MD considers the selection of lungs for transplantation summarizing the recent development of methods for histocompatability testing and the induction of specific immunological tolerance.

Frank J. Veith, MD discusses experimental and clinical lung transplantation, noting that many problems remain unsolved before further trials in human transplantation are justified.

Pierre Galletti, MD describes his oxygenator module, with an artificial blood-gas interface, as a close approximation to the natural lung.

Some unfavorable biological effects of extracorporeal circulation, related to mechanical, thermodynamic, biochemical and residence causes, are discussed by Jerzy Gajewski, MD.

Frank Freedman, PhD considers the problems in viable organ procurement, including the issues in organ preservation.

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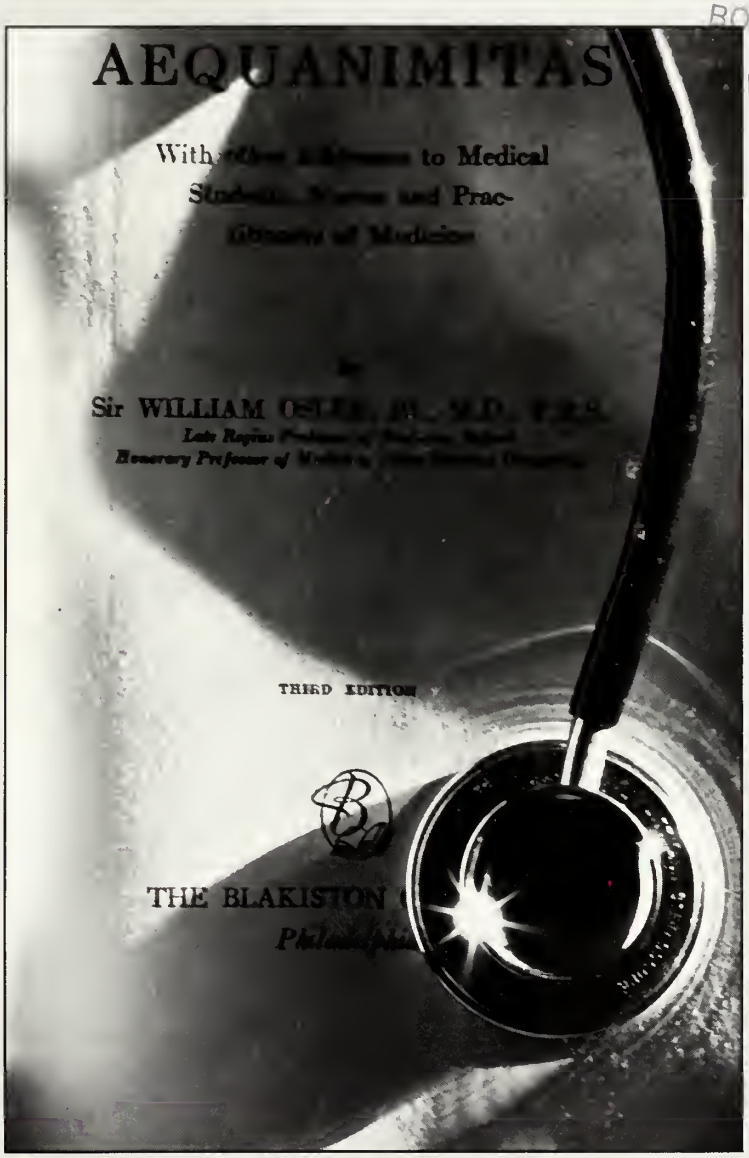

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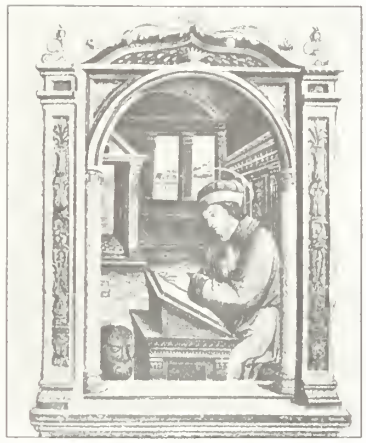

Doctors To Be: Making A Difference

As all of us who read the papers know, there is no shortage of criticism about medical care and about its providers in our country. Despite the litany of accusations against the medical profession, applications of students seeking admission to medical school continue to rise. According to the Association of American Medical Colleges, almost 46,000 individuals applied for the chance to fill one of the approximately 16,000 medical student places, almost a 3% rise from the high 1994 figures. At Brown University in the Program in Liberal Medical Education, some 2200 applications were processed for a class of 63 entering students. What role do these "doctors to be" have both in the provision of medical care and in the attitudes of the public about caregivers? Students, it would seem, play important roles in both of these domains. By bringing a fresh vantage point to accepted equations, students help to widen constructs, encourage change, and thereby, make a difference.

The current issue of RHODE ISLAND MEDICINE provides examples of how student commitment, energy and dedication serve to advance the level of medical care for patients and to further the bonds between doctors and patients. Whether through community voluntarism, projects, research, observation or reflections, students serve as catalysts, encouraging positive actions and furthering change. The articles which follow, written by students, provide insight into the impact of their endeavors. These young "doctors to be" are an enormous resource to our community and to our profession. The article on service learning delineates the bi-directional nature of such activities: the contributions students make to the community and the effectiveness of the process for student learning.

I want to recognize and to thank the following colleagues, who have worked together with me in reviewing, selecting and editing the students articles for this issues of Rhode Island Medicine: Debra B. Abeshaus, director, PLME Student Affairs and Office of Women in Medicine; Herbert Constantine, MD, professor of community health; Kathleen Luke, affinity group coordinator; Hugo Taussig, MD, clinical assistant professor of psychiatry; and Vincent Mor, PhD, professor of community health.

Lynn C. Epstein, MD.

The Poetical Epidemiologist

The year 1809 was truly auspicious: James Madison presided in the White House; in England, Darwin and Tennyson were born; in the United States it was the birth year of both Edgar Allen Poe and Abe Lincoln; and on August 29th of that year the son of the Reverend Ariel and Mrs. Sarah Holmes first saw the light of a Cambridge morning.

Called Wendell, though christened Oliver Wendell, he grew to maturity in a house situated on the northern border of Harvard Yard, a house described as "genteel rather than aristocratic." It was a house with a committed place in history, serving as the clandestine meeting site for Massachusetts patriots during the Revolutionary War.

Wendell was a precocious youngster with a lifelong weakness for both rhyming and punning. Small for his age and periodically asthmatic, he excelled nonetheless as a youth not by strength but by wit and loquaciousness. His childhood was marked by academic brilliance but also by a tendency to boyhood pranks described by his Calvinist elders as youthful corruptions, the natural wickedness of childhood. His was a constricted, theologically structured childhood. "To grow up in a narrow creed and to grow out of it," he wrote years later to Harriet Beecher Stowe, "is a tremendous trial of one's nature."

The perimeter of Wendell's early world was defined in Brahmin terms: his father's church, Harvard College and the elite community of Cambridge, "the sifted few." The eccentric Dr Benjamin Waterhouse, founder of Harvard medical school and late of Rhode Island, was his next door neighbor.

A leavening year at Andover preceded his admission to Harvard in 1825. The early 19th century Harvard student body was quite homogeneous in religion, socioeconomic background and political orientation. The curriculum was equally uniform, with courses in the classics, theology, history and particularly rhetoric. Wendell's undergraduate career became distinguishable from the others by three features: he substituted a new course in chemistry and mineralogy for Greek in his third year, and a course in contemporary French in his fourth year; but his enduring fame, with classmates at least, was his spontaneous poetic skills. He and his fellow students were expected to observe a self-effacing dress-code: a black suit, with unadorned buttons of a prescribed number. Church attendance was monitored and a Vigilant Committee aided the students in avoiding such distracting frivolities as the theater or horse-racing.

Upon graduation, Wendell entered the study of law but quickly found it unsatisfying. On the advice of his brother-in-law, Dr Usher Parsons, an eminent physician of Providence, he transferred to the Harvard School of Medicine, commencing his professional studies in 1830. The three-year curriculum consisted of five courses: theory and practice of medicine; anatomy & surgery; obstetrics & medical jurisprudence; chemistry; and materia medica. Each medical student was required to take two sequences of these five courses followed by three years of community apprenticeship and a written thesis to qualify for the doctorate degree. It was an era where neither microscopy, pathology nor physiology were taught and theories of contagion were disparaged. Rigorous instruction in human anatomy, at a time before the Massachusetts Anatomy Act had been enacted, made each

professor of anatomy, in essence, a committed grave robber.

Holmes apprenticed himself to Drs Warren, Channing and Jackson, three of the five members of the Harvard medical faculty. Two years later, and on the advice of Usher Parsons, he postponed his graduation to invest a year in graduate studies, largely in Paris. There, he studied under the great pathologist-clinician, Pierre C.A. Louis, regarded by historians as the father of the science of clinical epidemiology and the originator of the clinical pathological conference. While in Paris, Holmes was visited by his friend Ralph Waldo Emerson and both celebrated the fourth of July with "the venerable old Marquis de Lafayette." Much of his limited funds were invested in the purchase of a fine achromatic microscope. Before returning to America, he undertook the customary grand tour of Italy, Switzerland, England and the low countries. Within a month of his arrival in Boston he applied for his doctorate degree, his final dissertation being on the subject of acute pericarditis. Much of what he learned in the French school of medicine was reflected in Holmes' first professional publication, "Direct Exploration," a summary report on the new diagnostic technics of percussion and auscultation.

Coincident with his entrance into private practice at 35 Tremont Row, Boston, Holmes began a lifelong crusade against charlatanism and the imprudent, unscientific use of medications. A substantial fraction of his medical writings dealt with outright quackery and the worthlessness of most medications prescribed then by physicians. "The whole Materia Medica, with few exceptions, might be tossed to the fishes with no harm done, except possibly to the fishes." His views on medicine were not totally nihilistic however: he was an outspoken advocate of hygienic measures and enriched diets.

In 1840 Holmes married Amelia Jackson and in the following year his first son, Oliver Wendell Jr., was born. He now supported his family through his medical practice as well as his professorship (of anatomy and physiology) at Harvard. His facility with lecturing coupled with his wit and imagination led to his entrance into the burgeoning field of public lecturing. As the years passed he devoted an increasing fraction of his time to public discourses and to nonmedical writing. Among his more enduring works of poetry were "Old Ironsides" and "The Chambered Nautilus."

In 1842, using the technics of retrospective numerical surveys which he had learned from Professor Louis, Holmes undertook a study of the causes of puerperal sepsis (childbed fever). He collected all of the published cases and then augmented these data with direct interviews with most of the practitioners of his region before concluding that (1) puerperal fever and the disseminated sepsis which frequently followed inadvertent puncture wounds at the autopsy table were actually the same disease; (2) that puerperal fever was a communicable disease; and (3) that the active vector of contagion was the obstetrician. Once having warned his colleagues of the danger, he declared: "There is no tone deep enough for regret and no voice loud enough for warning. God forbid that any member of the profession to which a woman trusts her life, doubly precious at that eventful period, should hazard it negligently, unadvisedly, or selfishly." He concluded that puerperal fever was not a misfortune, but a crime. It should be noted that his critical paper on this subject was published in 1843, three years before a similar paper by Semmelweis.

In November 1846, following the inaugural use of ether by Morton at Massachusetts General Hospital, Holmes, an acknowledged master of neologisms, offered a new name for this innovation:" The state, I think, should be called *anaesthesia*." In 1847 Holmes was appointed as Dean of the Harvard Medical School, a post that he held with distinction for seven fruitful years. He continued his teaching of anatomy for decades thereafter and was responsible for such educational innovations as the introduction of histology and the regular use of rhyming mnemonics—most of them ribald—to assist medical students in remembering such details as the names of cranial nerves.

Holmes never disparaged physicians who sought alternative means of creativeness; and certainly he never overestimated the value of allopathic medicine. "It is a good thing to save a few lives, but it is better to infuse a new life into our language. At 22 when he should have been putting up the sign, "John Keats, Surgeon, the slightest favors or fevers gratefully received," he did better; he published Endymion."

For four more decades Holmes continued his teaching, his secular lecturing, his writing of poetry and essays. Truly, he was a man of science and a man of rhymes. On October 7, 1894, in the presence of his son and namesake, Holmes suddenly died - much as did his "wonderful one hoss shay." He lived 85 productive years as physician; internationally acclaimed author, poet and lecturer; revered role model for an obscure British physician, Arthur Conan Doyle, who named his chief literary creation, Sherlock Holmes, in his honor; close friend of Emerson, Lowell, Longfellow and Dickens; for five decades, honored teacher of Harvard medical students; eminent and scholarly Brahmin; father of a celebrated jurist and Supreme Court Justice; autocrat at the breakfast table; pioneer epidemiologist who clarified the cause and nature of childbed fever; physician.

Stanley M. Aronson, MD

Truth in Advertising

The remorseless rules of the market place have finally invaded the domain of medicine. Where such things as Koch's postulates, principled medical ethics, and the avoidance of advertising had once reigned, the elements of management, cost-benefit analyses and the art of persuasive selling now prevail.

Take, for example, the promoting of hospitals. No longer does their reputation rely solely on the excellence and diversity of their professional services. Now, hospitals must relinquish their honored place as accepted community resources - much like public libraries or churches - and join the grocery stores and the real estate agencies in the competitive, gritty world of the marketplace.

The New York city hospitals are currently employing a barrage of radio jingles and newspaper ads to hustle their services. A world famous orthopedic surgery hospital (which now labels itself by the euphemism: "specialists in mobility") routinely supplies innovative ads promoting its many clinical services. Its ad for knee replacement prostheses, for example, displays a youthful, attractive knee with these superimposed words:

"This knee: danced to Benny Goodman, knelt at the altar, climbed 30,000 steps, bounced five grandchildren, scrubbed the floor, scrubbed the floor, scrubbed the floor, marched on Washington, weeded a vegetable garden, held one temperamental dog; was reconstructed March 11, 1995."

This ideologically correct sequence is followed by the assurance: "Whether it's a joint, bone or muscle problem, we'll make sure your story continues." The ad combines nostalgic sentiment with a shrewd appreciation of which buttons to push. Nowhere in the ad, though, is there an attempt at preventive intervention; for example, could not the floor scrubbing - clearly the most damaging item on the provided roster of etiologic agents - have been shared with other members of the family ?

Perhaps these ads represent the beginning of a new trend in the brave new world of managed care. Indeed, they may well be defining a trail for other, less assertive

branches of medicine to hawk their wares. Consider, as a possibility, a hospital-based surgical service advertising, in warm, cuddly terms, a tribute to a segment of resected colon, extolling it for the many thousands of satisfying meals it had processed, including one stag party, one wedding banquet and scores of birthday party feasts, not to mention the many enterotoxic bacteria it had successfully overcome. Or a urological service talking glowingly of the decades of earnest, unobstructive and unheralded service provided by a prostate gland which, like some honored war veteran, was now to be resected because of battle scars; or even an oral surgery unit paying respectful, final homage to a noble molar tooth which, after years of painlessly macerating foods of every ethnic persuasion, had finally succumbed to the cavity-forming proclivities of countless lollipops.

The illness promoted by the hospital need not require a surgical remedy; it may be somewhat less flashy; a medical disorder perhaps, particularly one which has languished in the shadows of more aggressively advertised disorders. Our hospital conceivably might even declare a specific week dedicated to this obscure malady, with special rates for those fortunate ones whose diagnostic evaluation verifies the existence of this neglected disease of the week. A fortnight might even be set aside just for fevers of unknown origin and another redemptive week in early autumn for those social diseases which require atonement.

What qualities make hospital advertisement successful ? Certainly it should not list diseases which have little opportunity for cure; nor should the ad convey any sense of foreboding or peril to the awaiting consumer. Similarly, there should be no hint of risk factors or complications. The reader should not feel any critical urgency to adopt the therapy in haste; rather, it should be perceived as a wise, elective decision - much like buying a long-needed espresso machine - a relatively painless, natural event in the busy life of a creative adult. Promises, if made at all, should be kept vague and enigmatic. In summary, the ad message should be gentle, touched with vernacular humor but without stridency or intrusive prodding.

Given the limited sensitivities of the reading public (in contrast to the movie-going public), only a narrow range of medical procedures seem amenable to advertising. Operations which regularly diminish one's dignity or image of body-intactness might not be candidates for this form of hucksterring. How, for example, can an ad contemplate limb amputation without alienating the potential client ? Also, at first glance, it is difficult to conceive of any romantic merchandising of cholecystectomies or hemorrhoidectomies. Yet products for hemorrhoids and urinary incontinence - banal disorders confined to whispers some decades ago - are now happily purveyed through conventional channels.

When one reflects more deliberately upon the knee replacement ads in the New York newspapers, certain disquieting questions must inevitably arise: Why no mention of prevention as an alternative to surgical cure? Why not urge elimination of those known elements which result in a need for knee prosthesis? And is there no room for less aggressive forms of care? Furthermore, why regard a painful degenerative process as some rapturous event of benign Disneyworld dimensions? Finally, behind and beyond the beguiling appeal of the ad, is there any objective evidence that successful outcome rates in the advertising hospital are indeed higher than in the hospitals which maintain a respectful, ethical silence? Are the moral interests of medicine truly served by such promotions?

An anonymous New England poet, in just a few sentences, once defined the frequent lack of agreement between the visibility and the quality of an object under discussion:

The codfish lays ten thousand eggs,
The homely hen lays one. The codfish never cackles
To tell what she has done. And so we scorn the codfish,
While the humble hen we prize, Which only goes to show you
That it pays to advertise.

Stanley M. Aronson, MD

Letter to the Editor

To the Editor:

Congratulations on your symposium, "Capital Punishment and the Physician" that appeared in the August 1995 issue of Rhode Island Medicine. I have been an advocate of physicians publicly commenting on areas associated with medicine but not directly related. Capital punishment is a subject that physicians should have input. This was well done in the August issue. Social areas, such as public education, welfare, public works, sports, state of the economy, and our social justice system, have an impact on medicine. The state of patients' mental health, sanitation, nutritional requirements, and economic needs are very important.

In this light, physicians also should comment on over 1.5 million humans beings that currently are incarcerated in the USA. These people have tremendous medical, social, and educational needs. Should physicians be leaders in instituting a rehabilitation and educational program for these inmates or should we continue to inflict maximum punishment, let them out of jail and watch them commit worse crimes based on what have they learned in jail? Have we learned anything by their incarceration? Is Amnesty International correct when they have repeatedly accused the United States of having a draconic judicial system? Also, what about the latest DNA testing that demonstrated that about one-third of the prisoners do not match with material left at the crime scene and, may be innocent (Blake et al, *J Forensic Science*, May 1992). To say the least, we do not have an outstanding judicial system.

What to do? As a primary goal institute an educational rehabilitation program both in and out of jail. All criminals that committed non-violent crimes should be released from prison. Their punishment should be based on financially reimbursing their victims and performing menial tasks for the community. They may wear an electronic monitoring system with daily check-in periods, and engage only in limited social activities. For those who feel that this type of punishment for the non-violent criminal is too lenient, a scarlet letter type of emblem may be devised. The important point is to keep these non-violent criminals out of jail, force them in an intensive rehabilitation education, and coerce them to work to reimburse their victims.

The rewards of this new system are numerous. The non-violent criminal will not learn how to become a violent criminal through peer education in jail. The tax payer will not need to support as many prisons and prison staff. The savings can be directed towards our public school system and improvement of welfare and medical services.

In closing, let me say that physicians have an important obligation to help solve community problems that are not directly related to health. It would be appropriate to have a pro and con issue in Rhode Island Medicine on whether non-violent criminals should be jailed. This discussion may lead to positive action of great service to the community and place the physician in a leadership role for social and judicial reform. It may be called holistic medicine.

Guy A. Settipane, MD
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Brown University School of Medicine

The Health Status of the Providence-Area Homeless Population

Evan S. Dellon

. . . health and homelessness are linked in three ways: poor health can be a cause of homelessness, poor health can be an effect of homelessness, and homelessness complicates the delivery of health care.

In the past 15 years, the number of citations of "health" and 'homelessness" in the medical and sociological literature has skyrocketed (Figure 1). Recently, however, this interest has waned, perhaps indicating that the problems associated with homelessness have been solved. This is not the case; indeed, images of homeless people remain permanent fixtures of the modern urban landscape. Researchers estimate that between 250,000 and 3 million people are homeless in the United States;[1–5] the lower figures indicate the number of people who are homeless on any given night while the higher counts estimate the number of people who are homeless over the course of a year.[6]

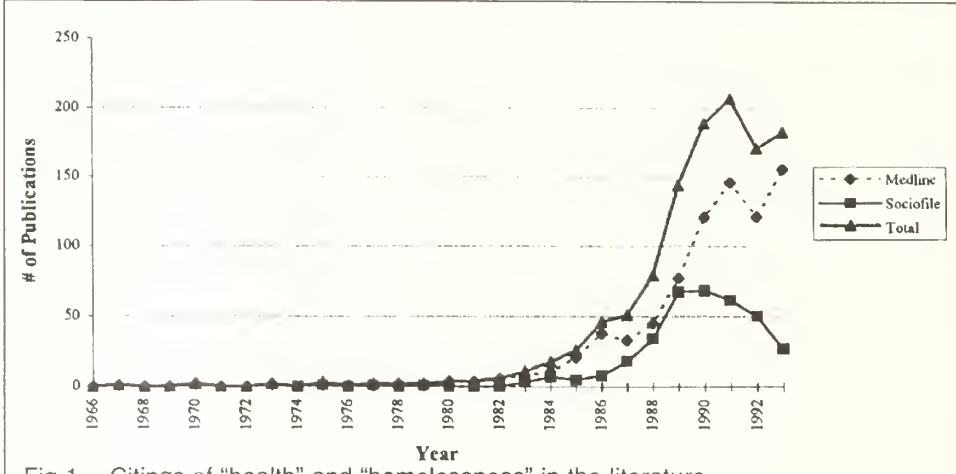

Fig 1.—Citings of "health" and "homelessness" in the literature.

Recognizing the current scope of homelessness and the fact that no published investigation deals specifically with the homeless population in Rhode Island, this study was devised with a number of goals in mind. The first objective was to describe the demographic characteristics of the Providence-area homeless population. The second was to explore the link between homelessness and health and determine whether any predisposing factors were associated with especially poor health in the homeless population. The final purpose was to examine the health care service utilization patterns of the Providence-area homeless.

Methods and Materials

This study was divided into two components and draws upon both to increase the validity of the data. The first drew from a series of face-to-face interviews with homeless people while the second section relied on medical records. Both protocols were approved by the Brown University Internal Review Board.

The Homeless Interview Sample. The definition of "homelessness" used for this project was adapted from the McKinney Homeless Assistance Act of 1987[7] and broadened by Roth et al.[8] Specifically, a homeless person was one who lacked regular, fixed, and adequate residence and therefore lived in minimal or no shelter for any period of time; or an individual who had a primary nighttime residence but that residence was a homeless shelter, a mission, a bus or train station, or any public or private place not designated for, or ordinarily used as, a regular sleeping accommodation for human beings; or an individual who lived in any cheap hotel, motel, home, or apartment (including those of friends or family) where the actual length of stay, or intent to stay, was 45 days or less. Any homeless person 18 years of age or older was eligible for this study.

The sampling design was a convenience sample; any homeless person found who met the above definition was interviewed. To supplement the selection process, "snowball" techniques were used. At the end of each interview, the respondent was asked if he/she knew of any other homeless people who might like to participate in the study.

The sample was primarily collected at and around Travelers Aid in the downtown Providence area (177 Union Street, Providence, RI, 02903, (401)-521-2255), a nonprofit, social service agency which is open 24 hours a day.

The Medical Records Sample. In addition to the homeless interview sample, a sample was drawn from the medical records collected on the Travelers Aid Medical Van. The sampling frame consisted of the intake forms and the medical records from all persons over the age of 18 who had visited the Medical Van between January and November of 1993.

The sample design utilized a systematic random sampling approach. It is important to note that only a person's first visit was used so that there was no repetition of individuals and so that the health status upon this initial visit could be assessed.

Data

The Homeless Interview Survey. To initiate an interview, the researcher (ESD) would approach a person who appeared to be homeless, explain the purpose of the study, relate the risks, benefits and confidential nature of the study, and offer a gift certificate valued at two dollars[9–11] from a local fast-food restaurant in exchange for participating. If the potential respondent agreed to participate in the interview, verbal consent was formally obtained. If the respondent did not agree to participate, he/she was thanked and left alone.

ABBREVIATIONS USED
ER: Emergency Room
NHIS: National Health Interview Survey

Evan Dellon graduated with honors from Brown University in May with a degree in Health and Society and a degree in Music. This fall, he will enter the Johns Hopkins University School of Medicine.

Table 1: Selected Demographic Characteristics of the Providence-Area Homeless Population as Compared with Three Additional Populations

Characteristic	Homeless Interview Sample (% of total)	Homeless Medical Records Sample (% of total)	Meta-Analysis Homeless Sample (% of total)	1993 National Health Interview Survey (% of total)	1990 RI Census (% of total)
Sex					
Male	80	66	75	42	48
Female	20	34	25	58	52
Age (mean years)	38	34	35	45	34*
Race/Ethnicity					
White	43	60	45	78	89
Black	36	24	40	13	3
Hispanic	13	15	14	7	4
Native American	6	1	–	1	2
Asian	1	0	–	1	1
Other	1	0	1	1	1
Education					
Less than a H.S. degree	50	24	74	22	28
H.S. degree or higher	50	76	26	78	72
Marital Status					
Marrried	9	13	11	54	56
Separated	7	5	15	3	1
Widowed	5	1	4	11	3
Divorced	11	18	18	11	7
Single/never married	69	60	52	20	33
Monthly individual income (mean dollars)	$262	–	$239	–	–
Poverty level					
Above	18	3	–	88	–
Below	82	97	–	12	–
Length of time homeless					
Less than one year	68	–	–	–	–
One year or greater	32	–	–	–	–
Place slept last night					
Inside	92%	–	–	–	–
Outside	8%	–	–	–	–

* median

The interviews were conducted from mid-October to mid-December, 1994 in a quiet space in the community room at Travelers Aid. After the interview, the homeless respondent was thanked and given the gift certificate. The process usually took between 10 and 15 minutes. When the interviews were completed, the data was coded and entered into the data worksheet of a statistical software package (SPSS-PC for Windows; SPSS Inc., 444 N. Michigan Avenue, Chicago, Illinois, 60611, (312)-329-3668).

The survey instrument used was constructed from a variety of previously validated sources.[8,12-17] The instrument was constructed in two basic sections. The first section was a screen which prevented people who were ineligible from participating. The second section collected information concerning demographic characteristics, health status, health care service utilization, social support, and deviant behaviors. In all, the survey collected 118 variables and is available from the author.

The Medical Records Review. All of the data (14 variables) pertaining to the medical records sample were collected through the use of a data collection instrument. The single page instrument was specially tailored to extract relevant information from the medical records and intake forms used on the Medical Van.

After the researcher located the files from January to November of 1993, the intake forms were separated and used to define the sample population. Next, the file was opened, confirmation and completion of the demographic information as found on the intake sheet was sought, and the diagnosis of the patient was found and recorded.

The medical records were not linked to the respondents of the homeless interview sample. Indeed, similar to the interview respondents, all medical records were treated confidentially.

After the records review was completed, the data were coded and entered into the data worksheet of a statistical software package (SPSS-PC for Windows).

Analysis

Similar data analyses schemes were devised for both the homeless interview and the medical records samples.

First, descriptive statistics were obtained for all of the variables. Demographic characteristics were compared with data from the National Health Interview Survey of data from the Rhode Island Census of 1990,[18-19] and results from a meta~analysis of 20 studies examining health and homelessness,[2,9,11,13,20-34] while health characteristics were compared with the NHIS data.

Second, cross-tabulations and chi-square analyses were conducted with selected sets of independent and dependent variables in order to assess whether any characteristics predispose sub-groups within the homeless

Table 2.—Selected Health-Related Characteristics of the Providence-Area Homeless Population as Compared to the 1993 National Health Interview Survey

Characteristic	Homeless Interview Sample (% of total)	1993 National Health Interview Survey (% of total)
Global health status self assessment		
Excellent	12	34
Very Good	4	29
Good	38	25
Fair	35	9
Poor	11	3
General health compared to one month ago		
Much better	5	–
Somewhat better	16	–
About the same	58	–
Somewhat worse	15	–
Much worse	7	–
General health compared to when respondent had a home		
Much better	3	–
Somewhat better	8	–
About the same	40	–
Somewhat worse	27	–
Much worse	22	–
Weight change upon becoming homeless		
Gained	12	–
Lost	49	–
No change	39	–
Chronic illness status		
Yes	55	–
No	45	–

population to especially poor health.

For the homeless interview sample, the independent variable set of possible explanatory characteristics germane to understanding variation in health status and service utilization included characteristics such as sex, age, race, marital status, education level, and poverty level. Marital status served as a proxy for social support while education and poverty were proxies for socioeconomic status. The final independent variables were the length of time spent homeless and the location in which the respondent spent the previous night.

The independent variable set for the medical records sample is identical to that of the interview sample, except that the two final variables were removed and replaced by the season in which the patient visited the Medical Van.

The dependent variable set for the homeless interview sample focused on the health and access to health care of the homeless population interviewed. Global self-assessed health status and health insurance status pertained directly to the health of the homeless person and their access to services. Weight change while homeless and morbidity due to chronic illness indicated the extent to which a respondent's health had been adversely effected by the conditions of homelessness. Finally, emergency room visitation and hospitalization spoke to the service utilization patterns of the homeless.

The dependent variable set for the medical records sample focused on the health and health outcomes of the patients in the Medical Van. These variables, which included health insurance status, patient complaint, and final diagnosis, are directly applicable to service utilization and physical disorder.

Lastly, within the appropriate samples, each independent variable was cross-tabulated and subjected to chi-square analysis with each dependent variable.

Results

The homeless interview sample was comprised of 102 men and women over the age of 18. The response rate for the interview procedure was 90%, a level of participation comparable to those found in other published studies.[10,13,22,25,26,28] The average time for each interview was 15 minutes, with a range of 7 to 30 minutes.

The medical records sample was comprised of 263 men and women over the age of 18. Thirty-six percent of the 728 initial patient visits to the Medical Van were sampled, a figure which represents 50% of all of those eligible for the study.

Demographic Characteristics. Table 1 presents selected (the remainder are presented elsewhere[35]) demographic characteristics of these two samples compared with the results from the meta-analysis of the literature, data from the 1993 NHIS, and data from the 1990 Rhode Island Census. Both the homeless interview and medical records sample are predominately male (80% and 66%), contrasting greatly with the NHIS and RI populations (42% and 48%). Further, homeless people in the two samples are younger than the respondents of the NHIS.

A variety of racial and ethnic groups are found in the homeless interview and medical records samples. While Whites compose the largest segment in both (43% and 60%), Blacks and Hispanics are disproportionately represented when compared with the NHIS and RI Census. Similarly, the respondents in the homeless interview sample are less well educated (50% did not graduate from high school) than the general RI population (28% did not graduate from high school).

The large majority of the respondents in both the interview and medical records samples are either single or have never married (69% and 60%); only 9% of those interviewed reported being currently married while only 13% of the records reviewed indicated that the patient was married. These figures are in marked contrast to the Rhode Island population in which approximately 56% of people are currently married.

Finally, the low monthly incomes reported by homeless people and the large percentage of homeless people below the poverty level indicate that the homeless interview population and people who utilize the Medical Van are impoverished.

Health-related Characteristics. Selected health-related characteristics of the homeless interview sample compared to data from the NHIS are presented in Table 2. Nearly one half (46%) of the homeless interview sample felt that they were in fair or poor health. This is in sharp contrast to the 1993 NHIS population in which only 12% of those interviewed characterized their health as either fair or poor. Further, 49% of the sample felt that, in general, their health deteriorated after they became homeless.

Corroborating this poor reported health status is the objective measure of weight loss. Fully 49% of the respondents reported that they lost a mean weight of 22 pounds since becoming homeless.

More than half (55%) of the homeless population reported that they suffer from some sort of chronic illness. While there was a great variety of disorders, the most common chronic illnesses among the sample were epilepsy (13%) and mental disorders (11%). Other illnesses included: arthri-

Table 3.—Selected Health Characteristics from the Travelers Aid Medical Van

	Patient Complaint from Medical Records (% of total)	Final Diagnosis from Medical Records (% of total)
Type of disorder		
Respiratory	41	46
Cardiovascular	4	4
Neurological	1	1
Musculoskeletal	13	10
Endocrine/Nutritional	2	2
Injury/Trauma	2	2
Dermatologic	15	14
Eye/Ear Disorder	7	4
Orodental	7	8
Gastrointestinal	6	5
Gentio-urinary	2	2
STD-related	1	1

tis (9%), asthma (9%), heart conditions (9%), back problems (7%), high blood pressure (7%), and diabetes (5%).

Similarly, the patients in the medical records sample exhibited a wide range of disorders (see Table 3). Most suffered from respiratory illnesses (41% complained of them and 46% were diagnosed with them), dermatologic disorders (15% and 14%), and musculoskeletal afflictions (13% and 10%). Upon further analysis, it was evident that the incidence of respiratory illness was the lowest in the summer and highest in fall and winter, while the incidence of dermatologic disorders was highest during the summer months.

The health service utilization characteristics of the homeless interview sample are presented in Table 4. Thirty-four percent of the sample had health insurance; of those people, the most (37%) had Medicaid. Three-quarters of the interview sample received regular health care, a proportion that is not different from the one found in the results from the NHIS. Of the respondents who received regular care, the largest groups relied on the Rhode Island Hospital ER (29%) and the Travelers Aid Medical Van (17%).

The majority of the sample (58%) visited an emergency room in the past year. Seventy-three percent of those who did visit an ER utilized the facility at Rhode Island Hospital. A large proportion of the sample (24%) was hospitalized in the last year. Again, many (42%) were hospitalized after first visiting the Rhode Island Hospital ER.

Cross-tabulation and Chi-Square Analyses. For both the homeless interview sample and the medical records sample, the cross-tabulation of the independent variable set by the dependent variable set did not produce many significant relations. Specifically, demographic variables such as sex, age, race, marital status, education level, and poverty level were not associated with substantial sub-group variation in health.

For the homeless interview sample, however, environmental factors seemed very important in relation to health (see Tables 5a and 5b). For instance, those who had been homeless for greater than one year were more likely to report fair or poor health than those who had been homeless for less than one year (63% vs 38%, $p < 0.05$). Similarly, those who spent the night outside (on the street or in a park) said that their health was fair or poor more often than those who spent the night inside (in a shelter, an abandoned building, or the residence of a friend or relative) (62% vs 45%, $p < 0.05$).

Discussion

A number of conclusions can be drawn from the results. First, it is clear that homeless people are in poor health; many homeless people feel their health is fair or poor, and there is a high prevalence of chronic illness in the homeless population. This is not a surprising result, and the literature confirms that health and homelessness are linked in three ways: poor health can be a cause of homelessness, poor health can be an effect of homelessness, and homelessness complicates the delivery of health care.[36-37] It is important to note, however, that the homeless people who participated in this study are likely to be in better health than many other homeless people because they are primarily shelter-based. Gelberg and Linn show that the shelter offers a protective environment that endows shelter-based homeless people with better health than homeless people who must live on the streets.[10] Indeed, only 8% of the homeless interview sample are what Rossi and Wright refer to as the "literal" homeless (those who sleep outside).[11] The results agree with these

Table 4.—Health Service Utilization Characteristics of the Providence-Area Homeless Population

Characteristic	Homeless Interview Sample (% of total)	1993 National Health Interview Survey (% of total)
Health insurance status		
Yes	34	–
No	66	–
Respondent receives regular care		
Yes	75	79
(RI Hospital ER)	(29)	–
(RI Hospital Walk-in Clinic)	(13)	–
(private hospital)	(9)	–
(VA hospital)	(9)	–
(community clinic)	(12)	–
(Travelers Aid Medical Van)	(17)	–
(other)	(11)	–
No	25	21
Respondent visits a doctor regularly		
Yes	42	
No	58	
Respondent visited an emergency room in the past year		
Yes	58	–
(RI Hospital ER)	(73)	–
(VA ER)	(5)	–
(Miriam Hospital ER)	(2)	–
(other local ER)	(9)	–
(other non-local ER)	(12)	–
No	42	–
Respondent was hospitalized in the past year		
Yes	24	–
No	76	–

findings as homeless people who spent the previous night outside were more likely to report fair or poor health.

Second, the few trends observed between selected demographic characteristics (the independent variable set) and certain measures of health (the dependent variable set) were not significant at the $p<0.05$ level; in effect, being a member of a particular subgroup did not predispose a homeless individual to poor health. Instead, poor health is strongly related to the stressful and unsanitary conditions of homelessness such as exposure to the elements and overcrowding in shelters and soup kitchens. For example, people who were homeless for longer periods of time were more likely to have poor health. Thus, homelessness itself appears to be a powerful leveler, an explanatory characteristic which accounts for the lack of variation due to other independent variables.[9] Homelessness is an overarching force which adversely effects health; it does not matter whether a particular individual is male, female, white, black, Hispanic, married, single, well-educated, or uneducated (although certain of these characteristics might predispose individuals to become homeless or find permanent residence) - once a person becomes homeless, his/her health is likely to deteriorate.

The third point to note is that although the homeless interview sample had fairly good access to care, this finding is a function of collecting data at Travelers Aid, a service agency which provides both on- and off-site health care, refers patients to hospitals when necessary, and links clients to social services. One must recognize, however, that the majority of the respondents received their health care in an emergency room, a setting which is not usually appropriate for treating the mostly chronic health problems of the homeless population (although it is effective in treating acute injuries and traumas suffered by homeless individuals).[35] It is beyond the scope of this paper to address this issue in more detail, but this statement implies that a new health care delivery system for the homeless should be developed. Such a system will be discussed elsewhere.[38]

Finally, it is important to address the generalizability of the homeless interview and medical records samples. Specifically, the sample design for the homeless interview sample was a sample of convenience: only the homeless people who were found and who agreed to be included in the study were interviewed. Additionally, all the medical records for the Travelers Aid Medical Van were used since the medical records did not indicate whether the patient was homeless. While these factors could conceivably introduce bias into the samples, an examination of Table 1 shows that upon comparison, the homeless interview sample is extremely similar to the average of all studies (from the meta-analysis) for each of the selected characteristics. Due to these similarities, one can conclude that the homeless interview sample is generalizable to the homeless population of Providence.

Table 5a.—Health Status Crosstabulated by the Length of Time Spent Homeless

	Length of time homeless	
	% < 1 year	% ≥ 1 year
Global health status self-assessment*		
Excellent, very good, or good	62	37
Fair or poor	38	63

*p < 0.05

Table 5b.—Health Status Crosstabulated by the Location in Which the Respondent Spent the Previous Night

	Location	
	% inside	% outside
Global health status self-assessment*		
Excellent, very good, or good	55	38
Fair or poor	45	62

*p<0.05

The medical records sample, however, is not entirely similar to either the interview sample of the average of all of the studies; it is comprised of more women and more Whites, as well as persons who have received more education. These discrepancies can be understood in the context of those served by the Medical Van. The population, then, must include people who have permanent residences, and therefore a slightly higher socioeconomic status, as well as those who are homeless. Thus, any generalizations based upon the medical records sample must be made carefully.

In conclusion, while this study has shown that the Providence-area homeless population is a heterogeneous group, it is possible to say that this is a largely younger population in which people who are racial minorities, uneducated, socially isolated, and extremely poor are over-represented. The great common denominator, however, is that most of the homeless individuals interviewed here are in poor health. Again, this is not surprising, but it must be emphasized that, as James Wright notes, "homelessness is a social condition whose medical consequences are obviously far-reaching."[36] This means that while the provision of health care to the homeless is a noble goal and will do much good for a great many individuals in the short term, the homeless population is so dynamic that in the long run, these measures may prove futile. The health status of the homeless population will only be improved when governments and communities are willing to make the commitment to attack the root causes of homelessness and provide homeless people with a permanent place to call home.

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Life as a child is the topic of the day.

Restrictive, abusive, destructive describe his plight
For the evil abusers have scarred his innocence.
Inside that Philadelphia cell,
The laughs and smiles of childhood found no place.

Ma and Pa expressed no interest
For money called them to service.
The end of the street blocked his freedom at day
While the basement window opened the world at night.

Little could stop this "city kid" from finding his way
For the bond of blood overcame any fear.
The sisters avoided ridicule in school
Thanks to the sheer will of their loving brother.

Give, give, give, he continued
Rarely taking for his own satisfaction.
Soon he reached adulthood
And the military called his name.

Dreams of falling led him to the plane
Jumping out into the blue sky.
Soon, marriage brought two children of his own
And an opportunity to experience childhood again.

His little ones will not hear his story
For they deserve their innocence.
Caring from afar makes life hard
As the words from the phone are distant, not close.

Depression, rejection, and loneliness must hit hard;
He is driven to the edge.
Falling, falling, he goes to the grave
But this time he may be saved.

Jeffrey R. Brown comes from West Hartford, CT and received his undergraduate degree from Brown University in Urban Studies. He is currently a first year medical student at Brown and plans to enter the primary care field.

Can Patients Accurately Predict How Illness Will Change Their Lives?

J. Winslow Alford

This study suggests that people can accurately predict how a major event would affect them but that the reported prediction differs with culture.

When patients undergo diagnostic tests for severe illnesses, it is not clear how much information physicians should share with them. Medical students are taught to be honest, open, and communicative with patients. Students must develop the skill of telling patients an "appropriate" amount of information regarding their condition. The challenge is to determine how much information is "appropriate".

This paper explores the utility of sharing information using the paradigm of examining people's ability to predict how an imagined event will affect them. Whether shared information is useful to patients depends on an accurate understanding of how an imagined scenario would affect them psychologically. If patients accurately understand how events will affect them, then they should be provided with detailed information about their situation. Accordingly, early discussions of hypothetical test results may be worthwhile. On the other hand, if patients' predicted reactions are inaccurate, then such discussions may be destructive, causing patients to construct unrealistic fantasies and to worry needlessly.

A second concern addressed by this study is the mechanism determining the change in beliefs following a major event. It has been suggested that these modifications are partially determined by socially constructed reactions to events and partially determined by internal needs.[1,2] Evidence for social construction argues that emotions serve as linchpins which link individuals to society; children (or adults) learn that certain circumstances call for specific appraisals and responses.[3] This interpretation suggests that emotional reactions of patients are guided by their socialization. Conversely, if internal needs determine the changes in beliefs, the responses that patients have to illness are designed to restore assumptions of stability which were threatened by the illness.

The mechanism of change in beliefs speaks to the issue of their predictability. If reactions are guided by socialization, then they should be predictable for the individual, because most adults are fully socialized when they are ill. On the other hand, if reactions are guided by internal needs, an individual could not predict them since the reactions would then serve to satisfy basic needs that have been threatened by the illness. Thus people would not know how they would react until they are actually faced with the illness.

Method

To explore changes in beliefs following major life events, 300 subjects in two different cultures (150 at the University of Massachusetts, 150 at the University of Madrid, Spain) were presented with hypothetical life events: the death of a loved one, or being the victim of a crime. Subjects were then asked to indicate whether they had experienced each event. People who had experienced an event were asked to report how that event affected them; those who had not experienced an event were asked to predict how that event might affect them. Whether reporting or predicting, the participants responded in two ways. First, they chose their own words to describe the predicted or reported effect in an open-ended format. Then, they rated the positive or negative effects on specific aspects of their lives (eg, trust in others, belief that the world is safe) using a 7-point scale ranging from -3 to +3. The words and phrases used to describe an effect were tallied, as were the numerical ratings.

The questionnaire addresses two major questions: Can people predict how an event will change them psychologically, and how are those changes formulated? If predictions from people who had not experienced events are similar to those reported by people who did experienced them, then this would suggest that the changes are guided by socialization. However, if the predictions are different than the actual experience of the event, it then seems likely that the differences represent unpredictable internal responses to the event itself that are not guided by socialization.

In addition, if responses differ with country of origin (Spain and the United States), that would further suggest that the changes are guided by the socialization of the culture around them. However, if people from different countries have the same responses, it would indicate that culture plays only a minor role in determining these psychological responses.

Results

The ratings for the effects of each event on beliefs were analyzed using a 2 (experience with event: yes or no) x 2 (nation: Spain or United States) repeated measures Multiple Analysis of Variance (MANOVA). Reported and predicted effects were similar (see chart 1) indicating that experience with an event had no significant effect, and a MANOVA for experience showed no main effect ($p>0.05$). However, nationality did significantly effect responses (see chart 2), and a MANOVA for nationality showed a main effect for nationality ($p<0.01$). American responses, though similar to each other, were nearly twice as negative as the Spanish responses.

Discussion

These results suggest that socialization plays an important predictive role in forming reactions to major events. It has been reported that the death of a loved one has different effects on Spaniards and Americans. For Americans, the death of a loved one causes a reduction in self esteem, affection for others, and trust of others, but in Spaniards death of a loved one causes greater negative effects on self esteem and positive effects on liking and trust of others.[4]

The literature on socialization sheds some light on the process of forming a reaction to major life events. Social construction theories contend that well socialized people understand both the meanings and effects of

ABBREVIATIONS USED
MANOVA: Multiple Analysis of Variance

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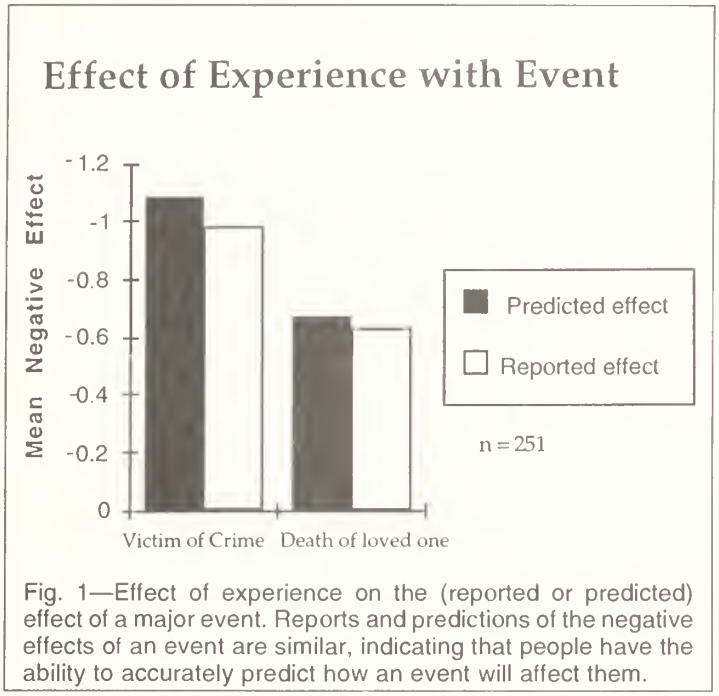

Fig. 1—Effect of experience on the (reported or predicted) effect of a major event. Reports and predictions of the negative effects of an event are similar, indicating that people have the ability to accurately predict how an event will affect them.

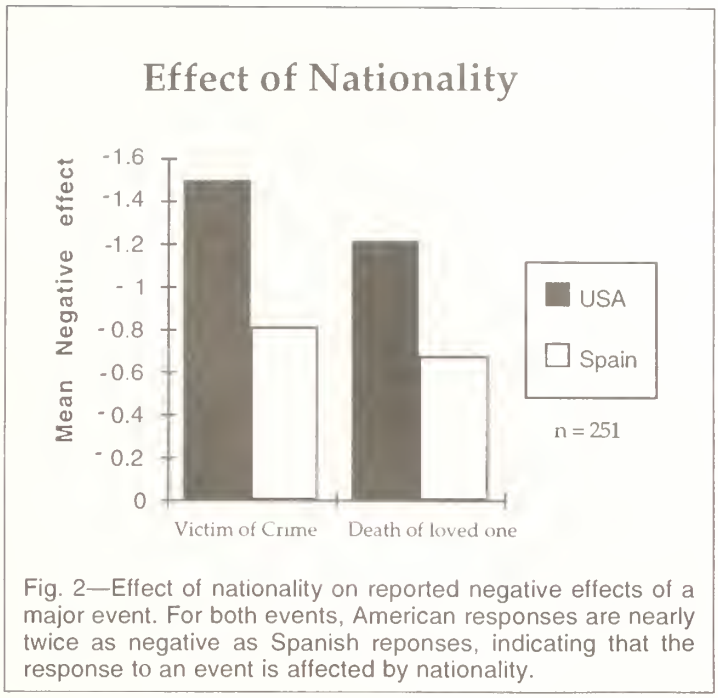

Fig. 2—Effect of nationality on reported negative effects of a major event. For both events, American responses are nearly twice as negative as Spanish reponses, indicating that the response to an event is affected by nationality.

events before they actually occur.[5] This view postulates that when events occur, individuals essentially "act out" roles they have learned from their society.[6] Conversely, internal need theorists contend that responses are determined by how individuals attempt to satisfy basic psychological needs in the face of new experiences.[7] Therefore, responses would be difficult to predict and would remain largely unknown to individuals until after events have occurred.

In the context of doctor-patient relationships, understanding patients' ability to predict reactions to events is valuable when deciding how much information about a situation patients should receive. Providing patients with full access to information about possible complications and future conditions permits them to imagine possible outcomes of diagnostic tests, and to prepare themselves to cope with the possibility of serious disease. If diagnostic tests are negative, then patients will be relieved but will understand the potential gravity. Patients may cope better with positive test results if they have some time to prepare themselves for worst case scenarios. This study suggests that people can accurately predict how a major event would affect them but that the reported prediction differs with culture. One possible explanation is that the changes following major life events are at least partially guided by socially constructed scripts. The results support the conclusions that patients do have the ability to accurately predict how illness will effect them emotionally and socially and that those effects are altered by the cultural context in which the illness occurs. It follows that patients should be provided with information about their potential situation because even before a diagnosis is made, that information is meaningful and useful to them. Additional study is required to delineate the type of information which is most useful to patients in their preparation for illness or disability.

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Health and Social Service Utilization by Older Jewish Immigrants to RI from the Former Soviet Union

Garey H. Noritz

The recent Russian immigrants are a distinct subgroup of the Rhode Island Jewish community. They have experienced great hardships which are reflected in their health status and functional measures.

Among the older Jews of Rhode Island are a growing number of recent immigrants to the United States. The largest group consists of Jews who have immigrated from Eastern Europe, especially the former Soviet states of Russia, Byelorussia, and the Ukraine. They have immigrated to the United States to escape anti-semitic persecution and to find better economic opportunities.

Since 1983, 643 Jews have immigrated from Eastern Europe to Rhode Island.[1] Of these, 119 (18.5%) were over the age of 65 upon arrival (Figure 1). Others will have turned 65 by now. This proportion of older people is slightly less than that of the rest of Rhode Island's Jewish population (23%).[2] These percentages are substantially larger than that of the over-65 cohort for the overall Rhode Island population, 15.0%.[3]

As refugees, the Russian immigrants are entitled to certain benefits, such as Social Security, Supplemental Security Income (SSI), and Medicaid, but not others, most notably Medicare. Frequently, their English abilities are poor. Their knowledge of social services, and the appropriate ways to utilize them, may also be limited.

These Russian immigrants are of the generation that survived World War II, the eastern advance of the Nazis, the siege of Leningrad, and the oppression of Stalin. They have lived through times of economic and nutritional hardship. These factors, along with cultural differences, combine to place specific demands on medical providers and the social service system.

These immigrants to Providence, by agreement with the federal government and the Hebrew Immigrant Aid Society (HIAS), are assisted in the transition by the Resettlement Program at Jewish Family Service (JFS). Upon landing in Providence, the immigrants fill out necessary paperwork with the assistance of the Resettlement Program and an interpreter. Through these forms, the immigrants apply for Food Stamps, SSI, and Medicaid. They are required (as are all refugees) to have a medical examination, which takes place at the Miriam Hospital. Vaccinations for children are verified. Housing is also available.

Immigrants are supported in this community for 8 months: one sponsored by the federal government, four sponsored by the State of Rhode Island, and three sponsored by the Jewish Federation of Rhode Island (JFRI). All children are registered in one of Providence's two Hebrew Day Schools, where tuition will be waived for up to two years.

In exchange for these benefits, the immigrants are required to study English every day, cooperate in a job search, send their children to school, and keep all appointments. Once the immigrants are settled, they are encouraged to assist in resettling newer immigrants.

There has been little research in recent years examining the experiences of Russian Jewish immigrants to the United States. One such paper examined the experience of Russian Jewish immigrants to California.[4] The authors found that 20% of the immigrants were older than 65. There was very little preventive medicine in Russia, and the immigrants had an unrealistic view of medicine in the United States. They expected their illnesses to be cured immediately upon their arrival. The immigrants tended to emphasize complaints more and to make inappropriate demands on the social service system through the medical system. That is, they expected help from their doctors in such matters as finding subsidized housing.

This paper will examine demographic characteristics of older Jews who have recently immigrated from the former Soviet Union. Health measures and service utilization rates will be presented and examined. These will be contrasted with findings for older Jews in Providence who are not recent immigrants. Recommendations for further service delivery to this immigrant group will then be presented.

Methods and Materials

The data presented below were gathered as part of a larger study of the older Jews of the Providence area. For inclusion in the sample, a respondent was required to be 65 years of age or older; describe him/herself as Jewish; live in Providence, Warwick, Cranston, Barrington, or Pawtucket; be non-institutionalized; and be cognitively able to both sign a consent form and complete the interview. Respondents who had emigrated from Eastern Europe in the last ten years were placed in the "Russian" group. Other respondents, regardless of place of birth, were assigned to the "American" group.

Neither the American nor Russian groups were identified by random sampling techniques. Because of time and budgetary constraints, most American respondents were referred to the study by doctors or staff at Rhode Island's two Kosher mealsites. All of the Russian respondents were approached either at the Kosher mealsite at the Jewish Community Center (JCC) on the East Side of Providence, or at their senior housing complex, also on the East Side. Focus groups with Russian immigrants were held at two senior housing centers.

After written consent was obtained, each respondent was interviewed in person using a survey instrument with 80 items. The respondents were interviewed individually or in small groups with the translator.

The competence of the respondent was verified at the beginning of the survey by asking him or her to memorize three objects. After the tenth question of the survey, the respondent was asked to repeat the three items back to the interviewer. The interview

ABBREVIATIONS USED

ADL: Activities of Daily Living
HIAS: Hebrew Immigrant Aid Society
IADL: Instrumental Activities of Daily Living
JCC: Jewish Community Center
JFRI: Jewish Federation of Rhode Island
JFS: Jewish Family Service
SSI: Social Security Income

Garey Noritz graduated last May from Brown University with Honors in Health and Society focusing on the health of the Jewish elderly of the Providence area. He is now a student in the Brown School of Medicine.

Table 1.—Characteristics of the Sample

Characteristic	Americans (n=46)	Russians (n=27)	Total (N=73)
Sex			
Male	39	37	38
Female	61	63	62
Age*			
60-74	40	78	54
75+	60	22	46
Education*			
HS/less than HS	67	33	55
More than HS	33	67	45
Marital Status			
Married	43.5	52	47
Not Married	56.5	48	53
Income (mean)*	23,491	7,447	15,621
Income*			
less than $7,100	11	61.5	36
$7,100 or more	89	38.5	64

* denotes significant difference between groups (p<.05) Note: percentages may not add to 100 due to rounding

continued if any or all of the three objects were repeated back correctly.

The Activities of Daily Living (ADL) and Instrumental Activities of Daily Living (IADL) indices were the chief measures used to explore the respondents' functional abilities. The ADLs include bathing, dressing, eating, transferring (out of bed or chair), toileting, and moving around indoors. The IADLs are cooking, shopping, and doing light or heavy housework. The ability to perform these activities is commonly taken as a measure of a person's functional independence.

Residents of the complexes were invited to share their experiences coming to Providence as immigrants, interacting with the various health and social systems and agencies, and to make suggestions as to what services might be improved to better meet their needs. The experiences of aging and the health care systems of the United States and Soviet Union were compared. At the first group, the translator assisted in the discussion. The second group included several people with fluency in English. They translated for the rest of the group.

Descriptive statistics were obtained for all variables in the survey. Because of the dual nature of the sample, all variables were analyzed both in total and with the sample divided into subgroups of Russians and Americans, which included native-born respondents and foreign-born persons who had immigrated more than ten years ago. These crosstabulations were analyzed using Pearson's Chi-Square test. Differences with p values less than .05 were deemed to be significant.

The descriptive statistics were divided into categories for discussion and analysis, which included demographics, health status and health needs, functional status and needs, medical insurance, nursing home attitudes, and social services and needs.

Data

The sampling method of this survey was not intended to be random. It was hoped, however, that a fairly *representative* sample of the population could be assembled. To a large extent this was accomplished, at least in terms of the American subgroup of the sample.

In terms of demographic measures, the American subgroup seems to be fairly representative of the Jews of Rhode Island as measured by Goldscheider and Goldstein in 1987.[2] For the distribution of denominations, birthplace, present city, education, marital status, and income, the samples seem to be very similar. In terms of gender, the sample underestimates the number of men in the over-65 population.

The demographic characteristics of the sample show several significant differences between subgroups of the sample (table 1). Sixty-two percent of the overall sample was female. Each of the subgroups showed similar gender breakdowns. In terms of age, the subgroups were significantly different. The

Table 2.—Health Measures

Characteristic	Americans (n=46)	Russians (n=27)	Total (N=73)
Health Status			
Exc, VG, Good	67	44	59
Fair, Poor	33	56	41
Vision Problems			
Yes	16	4	11
No	84	96	89
Hearing Problems			
Yes	6.5	18.5	11
No	93.5	81.5	89
Balance Problems*			
Yes	26	56	37
No	74	44	63
Needs More Help With Health*			
Yes	2	59	23
No	98	41	77
Needs Help With Medications*			
Yes	11	30	18
No	89	70	82
Health Change in Last Year			
Better	4	26	12
Same	74	37	60
Worse	22	37	2 7
Memory Problems			
Often/Sometimes	54	56	55
Rarely/Never	46	44	45
Number of ADL/IADL deficiencies**			
None	59	63	60
1-2	28	26	27
3+	13	11	12

* denotes significant difference between groups (p<.05)
Note: percentages may not add to 100 due to rounding
**The ten ADL/IADL skills are bathing, dressing, eating, transferring (out of bed or chair), toileting, and moving around indoors, cooking, shopping, and doing light and heavy housework

Russian respondents were much younger than the American respondents. 78% of the Russians were under age 75, while only 40% of the Americans were this young. In terms of median age, the Russians were six years younger, 71 to 77 years.

The Russian subgroup was also significantly better educated than the American subgroup. Two-thirds of the Russians had more than a high school education, while two-thirds of the Americans had only a high school education or less. In marital status, the subgroups were similar. Fifty-two percent of the Russians were married, while 43.5% of the Americans were married.

The income measures show the greatest disparities between the subgroups. All of the Russian respondents received the majority of their incomes from social security programs, while only 46% of the Americans did. The mean income of the Russian subgroup was over $16,000 less than the American subgroup. Only 11% of the Americans had incomes below the poverty line of $7,100, while 61.5% of the Russian subgroup did.

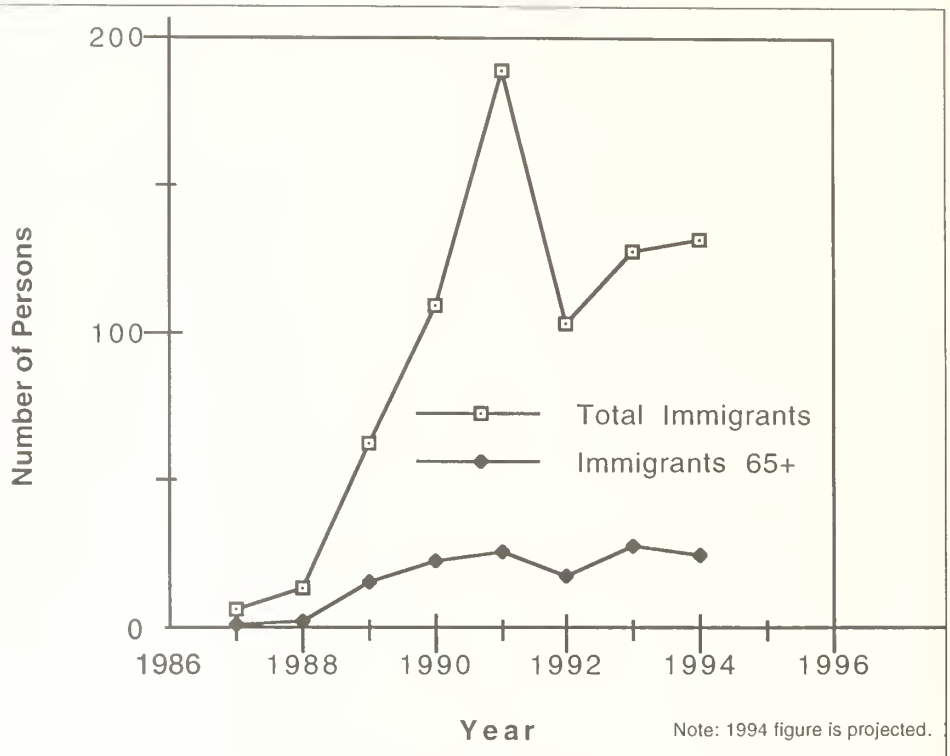

Fig 1.—Immigration of Russian Jews to Rhode Island.

Results

Health measures of the sample are reported in Table 2. Most of the self-reported measures of health were similar between the subgroups. The two subgroups reported similar levels of 'good' or better health, vision problems, hearing problems, memory problems and deficiencies in the ADLs and IADLs. Significantly more Russians did report problems with balance and dizziness.

The biggest difference between subgroups was in the amount of assistance they needed with their health, and specifically in taking medications. Fifty-nine percent of the Russians reported that they needed more help with their health, primarily from doctors. Only two percent of the Americans reported this need. Thirty percent of the Russians reported that they needed help taking medications, while only 11% of the Americans had this need.

Table 3 shows differences in service usage and attitudes. Several of these were significantly different between subgroups. All of the Russians used Medicaid, while none had Medicare. Nine percent of the American subgroup had Medicaid in addition to Medicare. Three quarters of the Russian subgroup had a Lifeline or other emergency response system in their homes; only 15% of Americans had this system. None of the Russians ever used the Senior transportation system; while 28% of Americans used it at least occasionally. All of the Russians also preferred to participate in Jewish social programs, while 54.5% of Americans had this preference.

No significant difference was found for attitudes towards nursing home care. Statistically similar numbers thought it was likely that they would eventually move to nursing homes. In addition, very similar proportions of respondents would prefer a Jewish Home to a non-Jewish one. Overall, 85% of respondents said they would prefer a Jewish Home.

Slightly more Russians (26%) reported

Table 3.—Service Usage and Attitudes

Characteristic	Americans (n=46)	Russians (n=27)	Total (N=73)
Receives Medicaid*			
Yes	9	100	42.5
Likely to move to Nursing Home			
Very Likely	7	4	
Somewhat Likely	31	52	39
Not Likely	62	48	57
Would Move to Jewish Home over Another Home			
Yes	82.5	89	85
No	17.5	11	15
Has Lifeline or other Emergency Response system*			
Yes	15	74	37
No	85	26	63
Transportation Problems			
Significant	11	26	16
Small	9	7	8
None	80	67	75
Uses Senior van*			
Yes	28	19	
No	72	100	81
Prefers Jewish Social Programs*			
Yes	54.5	100	72
No	45.5	28	

* denotes significant difference between groups (p<.05) Note: percentages may not add to 100 due to rounding

problems with transportation than Americans (11%), but this difference was not significant.

Discussion

All older Russian immigrants are eligible for and receive the same financial benefits, i.e. SSI, Medicaid, Food Stamps, Housing Subsidies, and Energy Assistance. Subsequently, they all have fairly similar incomes. The irony, according to the translator, is that "The communist dream to make everyone equal has been realized here [in Providence]."[5]

Older Russians experience more health problems than either younger Russians or the overall population. This is the generation that lived through World War II, the siege of Leningrad, the reign of Stalin, and other hardships. This is reflected in their lower health status. In addition, they have more trouble learning English than their younger counterparts, which further interferes with their ability to use services here.

Many of the members of the Russian subgroup were professionals in the Soviet Union- doctors, engineers, and scientists. However, not one Russian respondent was employed. The language barrier is difficult to overcome, but the older people have not attempted to get jobs because they feared that this would take jobs away from their children. In addition, the retirement age in the Soviet Union was 55 for women and 60 for men, influencing work attitudes here.

Many Russian respondents cited problems with the medical system as a major detriment to their health. Overall, health care here in the United States is of higher quality, but structural problems exist. All of the survey respondents depended on Medicaid as their sole source of medical insurance. This limits the number of doctors that they can see. They have found it very difficult to get appointments with specialists because of their insurance status. This forces many of them to rely completely on the clinic at the Miriam. Here they face long waits and care primarily from students and residents, another source of complaint. Fifty-nine percent of the Russian respondents said that they needed more help taking care of their health.

The Russian respondents reported that they needed more help taking medications. In addition to the normal challenges that face older people (such as opening the bottles and following the right schedule), the Russians reported difficulty in reading and understanding the labels.

The Russian respondents also reported more problems with transportation.

Safety was cited as a concern by several members of the focus groups. They recognize that Providence is not as dangerous as other U.S. cities, but they are rightfully concerned for their physical safety, particularly at night.

It was clear that nursing homes in the former Soviet Union were very dismal. Like the American subgroup, all of the Russian respondents hoped that it would not be necessary for them to move into a skilled nursing facility. Although the rates at which the subgroups said that they were likely to move into nursing homes were not significantly different between groups, the resistance seemed to be especially strong among the Russian subgroup. The Russian respondents had a very clear desire to go to a Jewish nursing home if it became necessary. Primarily, they wanted to be sure that they would be with other Russian people.

Education about the way in which the social service system in Providence works, and the types of services that are available are especially needed for this part of the community. For instance, there was a misconception among the respondents that their doctor was the appropriate person to solve problems with benefits or services. Doctors often do not have the resources, time, or training to deal with these problems, which are better left to social workers and case managers.

After finishing with the Resettlement Program, there are few coordinated services for the Russian immigrants. Language becomes a very large problem because the other Jewish agencies are not geared to helping non-English speakers. One idea that has been put forth is to hire part-time translators from within the Russian community to help explain services or to help in medical interviews. Another solution might be to set up a phone hotline with similar goals.[6]

Conclusion

The recent Russian immigrants are a distinct subgroup of the Rhode Island Jewish community. They have experienced great hardships, which are reflected in their health status and functional measures. The Resettlement Program at JFS does an excellent job of assisting immigrants upon their arrival, but less help is subsequently available. Health providers and social service agencies must be aware of these differences in order to best serve this Russian community. The continued integration of older Russian people into the community will be beneficial for their health and well-being.

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Domestic Violence: A Guide for Health Care Providers

Alexes Hazen and Yvonne Mark

Domestic violence is the leading cause of injuries to women. Physicians are often uniquely situated to identify cases of domestic abuse and facilitate appropriate counselling and legal action. Yet, in examining their patients, some physicians do not routinely check for indications of domestic violence or pursue cases where such abuse is suspected. The reluctance to get involved is understandable although not excusable. Domestic violence is disturbing, questions about it are frequently interpreted as accusatory, and efforts to intervene often fail. Traditionally medical schools give little training in recognition of and response to domestic violence.

We created this pamphlet as a guide for health care providers and medical students.

INTRODUCTION

Domestic violence is the leading cause of injury to women, above muggings, car accidents, and rapes combined. An estimated 8-12 million women in the United States are at risk of being abused by their current or former intimate partners. This violence causes serious psychological, physical, and social sequelae for these women and their families.

Battered women may account for:

- 22% to 35% of women seeking care for any reason in emergency departments
- 25% of women who attempt suicide
- 23% of pregnant women seeking prenatal care
- 45% to 59% of mothers of abused children

Because a physician may be the first nonfamily member to whom an abused victim turns for help, he or she has a unique opportunity and responsibility to intervene. Battered women often present with repeated injuries, medical complaints, and mental health problems, all of which may result from living in an abusive relationship. Physicians in all practice settings routinely see the consequences of violence and abuse, but often fail to recognize or acknowledge their abusive etiologies. **By recognizing and treating the effects of domestic violence, and by providing referrals for shelters, counseling and advocacy, health professionals can help battered women regain control of their lives.**

GOALS OF THIS PAMPHLET

Domestic violence Is a crime. It can be a debilitating, ongoing experience of psychological, physical, and/or sexual abuse usually in the home.

The **goals of this pamphlet** are to:

- Familiarize you with the magnitude of the problem
- Describe how to **identify abuse** and violence through **routine screening** and **recognition of clinical presentations**
- Help you **assess the impact of abuse and violence** on your patients' health and well-being
- Provide **examples of how to ask questions** in ways that can elicit meaningful responses and help women to explore their options and take action
- Provide information on **appropriate resources** for referral
- Familiarize you with the **legal aspects** of medical care, including **reporting requirements** for physicians

Note: This pamphlet refers to the victim as female and the abuser as male in order to reflect the predominant form of domestic violence as we currently understand it. However, it is important to remain open to the possibility of male abused victims and female abusers.

FORMS OF ABUSE

(1) Psychological or emotional abuse may precede or accompany physical violence, as a means of **controlling through fear and degradation.** Emotional abuse includes:
- Threats of harm
- Physical and social isolation
- Extreme jealousy and possessiveness
- Deprivation and intimidation
- Degradation and humiliation

(2) Physical abuse is **often recurrent and escalates** in both frequency and severity. Physical abuse includes:
- Shoving, slapping, punching, kicking, choking
- Assault with a weapon
- Refusing to help when the victim is sick or injured

(3) Sexual abuse in violent relationships is often the most difficult aspect of abuse for women to discuss. It may include any **form of forced sex or sexual degradation,** such as:
- Pursuing sexual activity when she is not fully conscious, is unable, is unwilling, or is afraid to say no
- Criticizing her and calling her sexually degrading names
- Rape

IF I SUSPECT ABUSE, WHAT SHOULD I SAY?

The manner in which you ask questions is very important:

- Ask the patient **simple, direct, open-ended questions.**
- **Talk to the patient alone.** Ask family members to wait outside, and take her to a private examination room.
- **Eye contact, tone of voice,** and **open, receptive body positions** are important.

Open the conversation by saying something such as, "Many people are hurt by someone they love. I'm concerned about that. When you and your partner (husband/boyfriend) fight, how do you do it? [Prompting and follow-up questions: Does the fighting become physical? Are you ever afraid? Does he verbally threaten you?]"

Another approach is to say, "Safety in the home is so important. I want to

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know how safe you feel in your home. [Is there a gun in your house? Where is it kept?] Is there physical fighting in your home? Is your freedom in any way constrained by your husband/boyfriend?"

WHAT SHOULD I LOOK FOR?

Battered women exhibit **a variety of responses** to the stress of ongoing abuse.

(1) Behavioral Signs:

- Patient **may appear frightened, ashamed, evasive, inappropriately jovial or nonchalant about injuries.**
- **She may believe she deserves the abuse**
- **She may take responsibility for his violence.**
- **Partner may accompany patient and answer all questions** directed at her.
- **Patient may be reluctant to speak or disagree** in front of her partner
- **Denial or minimization of violence**
- **Self-blame** for her partner's violence

(2) Medical Findings:

- **Pain:** chronic or psychogenic
- **Physical symptoms related to stress, anxiety disorders, or depression.** Examples include:
  - Sleep, mood, and appetite disturbances
  - GI complaints
  - Atypical chest pain or palpitations
  - Hyperventilation or dyspnea
  - Chronic headaches, fatigue, decreased concentration, dizziness, paresthesias
  - Sexual dysfunction
- **Recurrent genitourinary infections**
- Frequent use of prescribed **tranquilizers, pain medications, alcohol, or non-prescription drugs**
- **Frequent hospital visits with vague complaints** or symptoms without evidence of physiologic abnormality

(3) Physical Injuries:

Common types of injury include:

- **Injuries to the *bathing suit area*** (breasts, genitalia, buttocks) and/or head, neck, chest, and abdomen
- **Recurrent injuries or injuries not consistent with explanation given**
- **Unexplained** bruises, abrasions, lacerations, fractures, sprains, or **multiple injuries often of varying ages**
- **Evidence of old, untreated injuries, scars, improperly healed fractures**
- Injuries during pregnancy

(4) Mental Health/Psychiatric Symptoms:

The stress of domestic violence may induce psychiatric symptoms in women without underlying psychiatric disorders, as well as aggravate symptoms in women with comorbid underlying psychiatric disorders. Psychiatric symptoms of abuse include the following:

- History of **suicide attempts, alcohol or drug abuse**
- **Feelings of isolation and inability to cope**
- **Depression**
- **Panic attacks**

WHAT SHOULD I DO?

(1) Routinely Screen All Female Patients and Male Patients as Indicated.

Eighty percent of battered women say they feel it is appropriate to ask about domestic violence during the course of a regular exam. Screen all patients. If you don't ask questions, patients often will not tell you about abuse.

(2) Be Supportive!

- **Watch for signs of abuse** (see What should I look for?)
- **Assure the victim that you can be trusted.** Simply say, "I'm worried about your safety. If you ever need help, I'm here." Give her the local 24-hour domestic violence hotline where she can talk about her feelings confidentially [(401) 861-2760]. **Note**: Tell her to put the number in a safe place for her access, where her abuser will not find it (it may escalate violence if he finds it).
- **Avoid comments that imply judgment**, such as,
- "Why do you stay with him?" Victims of abuse need help building up their self-confidence. Remind them of the smart steps they *have* taken, and the courageous things they *have* done.
- Finally, **don't give up on her**. Battered women typically return to their abusers several times before they feel strong enough to leave the violence for good. Use a domestic violence hotline for your own support, and realize that helping an abuse victim is a slow process.

(3) Make a safety plan with the patient.

- Is the patient safe to go home? If not, does she have somewhere else she can go? Do not let the victim leave until her safety is ensured.
- Encourage the victim to hide some clothes, money, important papers, and identification with a friend or in her car in case she has to leave quickly.

(4) Make the patient aware of her rights.

According to current Rhode Island law, the police are required to arrest anyone who has committed a family violence crime. They are also required to present the victim with a copy of the victim's rights brochure, photograph any visible injuries, file a DV-1 form to document the incident, and transport her to a medical facility, if required.

The patient needs to contact the police within 48 hours of the assault, in most cases. Urge her to do so to protect herself from further harm.

Let the patient decide. If she does call the police, encourage her to have a friend with her for support. If the officer is unresponsive or unsympathetic, encourage her to write down the name and badge number and contact the police advocate to make a complaint.

(5) Explain the court order options that can help protect the patient.

Remind the victim that these orders are only pieces of paper and do not absolutely guarantee her safety.

a. ***No-Contact order***

This is a *criminal court order* that forbids the perpetrator from harassing, interfering with, molesting, or threatening the victim in any manner. This order is automatically issued at the time of arrest and is in effect until the termination of the court case or 1 year after it is issued if extended by the victim. Violation of this no-contact order is a criminal offense.

b. ***Restraining Order***

This is a *civil court order that* forbids the perpetrator from assaulting or harassing the victim and may order the perpetrator to leave the home. A temporary restraining order may be issued immediately upon court contact to take effect until the formal restraining order is granted.

c. ***Battered Spouse Waiver Amendment***
If a woman has conditional residency (e.g. she is an immigrant or refugee) and her abusive spouse refuses to petition for her permanent residency, she can apply for a waiver of the joint petition on one of 3 grounds: (1) her marriage has been terminated, (2) she has experienced extreme hardship, (3) she or her child has been abused by her spouse.

(6) Document legibly and completely.

After the wounds have healed, your detailed record **may be the only evidence** a patient has **if she decides to file a criminal complaint or pursue a divorce in court.** A clear, well-documented medical record **can reduce the amount of time you will need to spend testifying,** and **can assist the courts in understanding the medical perspective of the abuse.**

Records should include the following:

1. Chief complaint & description of abusive event. (Use the patient's own words whenever possible)
2. Complete medical history
3. Relevant social history
4. Detailed description of injuries: number, type, size, location, resolution, possible cause and explanation given. Record location and nature of injuries on a body chart.
5. Your opinion on whether the explanation fits the injury
6. Results of pertinent lab and diagnostic procedures
7. If police are called, the officer's name and any actions taken should be noted.
8. Photographs are particularly valuable. Ask the patient's permission to take photos.
   a. Photograph injuries before treatment.
   b. Use color film and a color standard.
   c. Photograph from different angles, full body, and close-up.
   d. Hold up a coin or ruler to indicate size.
   e. Include patient's face in at least one picture.
   f. Take 2 pictures of each trauma site.
   g. Mark photos precisely with patient's name, date, photographer, and others present.
9. Store records properly with access limited to professional staff.

(7) Report all suspected cases of phvsical or sexual abuse, or neglect of children, the elderly, or disabled people to the state protective services.

Rhode Island law requires this. There are no mandated reporting requirements for non-disabled individuals between the ages of 18 to 60. This means that there is no mandatory reporting for most battered women.

(8) Refer the Patient to Shelters or for Counseling.

Domestic violence services:

- **Women's Center of RI**, Providence **(401) 861-2760**
  - 24-hour hotline and shelter
  - health advocate for women in hospitals/emergency rooms (Meghan McGrath)
  - advocates available in Spanish and Portuguese
  - support groups
- **Sojourner House,** Woonsocket **(401) 765-3232**
- **EBC House,** Warwick **(401) 738-1700**
- **Blackstone Shelter,** Central Falls **(401) 723-3057**
- **Women's Resource Center,** So. County **(401) 782-3990**
- **New Hope**, Attleboro **(508) 222-2113**
- **Our Sister's Place**, Fall River **(508) 677-0224**
- **Heaven of Grace**, South County **(401) 766-0284**
- **New Waves**, Providence **(401) 272-3212**
  - lesbian abuse hotline
- **Rape Crisis Hotline(401) 421-4100**

Legal advocacy

- **Restraining Order Office** (401) 277-6936
- **Court advocate,** Roberta Collaza **(401) 861-2760**
- **Domestic Violence Unit** **(401) 782-4154**
  - Janice DuBois
- **RI Coalition Against Domestic Violence**
  Crisis information **1(800) 494-8100**
  Business **(401) 723-3051**

Substance abuse:

- **Talbot House**–accepts Medicaid **(401) 785-8307**
- **Commitment to Change**, St. Joseph's Hospital **(401) 456-3250**

Abuse of children, elderly, and disabled ***(Mandatory reporting numbers)***

- **DCYF** - child abuse hotline **1(800) RI-CHILD**
- **Department of Elderly Affairs** **1(800) 322-2880**
  – for victims 60 years or older
- **Developmentally Disabled (RIPAS)** **(401) 831-3150**

Other helpful numbers:

- **The Providence Center** **(401) 274-7111**
  — for 24-hour emergencies
- **Bradley Hospital - for children** **(401) 434-3400**
- **Pregnancy Hotline** **(401) 456-HELP**
- **RI Coalition for the Homeless** **(401) 421-6458**
- **Traveler's Aide Society of RI** **(401) 521-2255**
- **Runaway Hotline** **1(800) 231-6946**
- **RI Legal Services** **(401) 274-2652**
- **Legal Aid Society of RI** **(401) 331-4665**
- **WIC Program** **1(800) 942-7434**
- **Direct Action for Rights & Equality** **(401) 351-6960**
- **Project AIDS** **(401) 831-5522**
- **Gay/Lesbian Helpline** **(401) 751-3322**

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Physicians Against Domestic Violence

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HIV Risk: No Impact on Medical Student Specialty Choice

Joshua Gady, Scott Boyan, Mahesh Jayaraman, Margaret Kelly, Leo Kobayashi, Peter Lee, Timothy Lynch, Myechia Minter, Anne Marie Spooner, Jerrod Taylor, Bruce Becker, MD, Liudvikas Jagminas, MD, Marc Shapiro, MD

The encouraging results of this pilot survey indicate that medical students about to complete their education and enter residency do not feel that their choice of specialty was influenced by their perceived risk of contracting HIV, or their attitudes toward HIV-infected patients.

Since the start of the AIDS epidemic, HIV education has become an essential part of medical school. In February 1989, the Association of American Medical Colleges published a statement about the responsibility of medical students in treating HIV infected patients. It recommended that medical students overcome prejudicial attitudes, and understand and accept personal risk when treating HIV patients.[1] Given these recommendations, Loring et al surveyed medical students at Johns Hopkins School of Medicine to assess their attitudes toward treating HIV infected patients, and to determine the students' perception of HIV exposure risk in various specialties.[2] This study found that students had an overall willingness to care for HIV-positive patients, and the AIDS epidemic had little influence on their choices of future career and practice locations.

This pilot study will seek to determine if Loring's conclusions are applicable and reproducible among fourth year medical students in New England. Furthermore, the purpose is to determine if the aforementioned factors impacted on these fourth year medical students' specialty choices.

Methods

Two New England medical schools were selected for student survey, each with different geographic locations, clinical settings, and HIV prevalences. All fourth year medical students were mailed a copy of this anonymous survey (Figure 1), with a self-addressed return envelope.

In addition to basic demographic information, the one-page survey instrument asked a number of questions concerning the student's career plans, the risk he or she perceived to exist of contracting HIV while practicing in his or her chosen specialty, personal attitudes toward treating HIV-positive patients, and the student's perception of the relative risk of his/her chosen specialty compared with others (Table 1). Data were entered into a spreadsheet to evaluate the information as a whole, as well as to compare the two medical schools.

HIV SURVEY

1. Age:
2. Gender: a. Male b. Female
3. Ethnicity:
   a. African-American c. Hispanic e. Native American
   b. Caucasian d Asian f. Other
4. What specialty did you match in?
5. What specialty did you most want to train in?
6. Please rank the specialties in descending order (greatest to least) for physician risk of being infected with HIV.

Anesthesiology	Ophthalmology	Psychiatry
Emergency Medicine	Orthopedics	Radiology
Family Medicine	Pathology	Surgery
Internal Medicine	Pediatrics	OB GYN

7. I have been stuck with a needle during medical school. a. YES b. NO
8. I have been stuck with a needle from an HIV infected patient. a. YES b. NO
9. I have had an open wound exposure to HIV positive blood. a. YES b. NO

For the following questions use the scale indicated below.

1	2	3	4	5
Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree

10. I have had an adequate clinical experience with HIV positive patients.
11. I think the specialty I have chosen entails a considerable risk of being infected with HIV.
12. I am at greater risk of becoming infected with HIV when I treat HIV positive patients.
13. I am at greater risk of becoming infected with HIV when I treat homosexual patients.
14. I am at greater risk of becoming infected with HIV when I treat patients who have used intravenous drugs.
15. Physicians should be able to refuse to treat HIV positive patients.
16. HIV risk has influenced my specialty choice.
17. HIV risk has influenced the city where I preferred to do my residency.
18. HIV risk has influenced the type of hospital (Community vs. Academic) where I preferred to do my residency.
19. I avoided practice in locations with a high prevalence of HIV.

Results

Thirty-two students from the Boston University School of Medicine responded to the survey. The average age of the respondent was 28, 59% of whom were male, 41% female. Thirty-three students from the Brown University School of Medicine responded to the survey. The average age of these respondents was 27, 55% of whom were male, 45% female. Of the Boston students, the ethnicity distribution

ABBREVIATIONS USED
AIDS: Acquired immune deficiency syndrome
HIV: Human immunodeficiency virus

The authors represent an "affinity group" at the Brown University School of Medicine. The students are currently in their second year of medical school at Brown University, and each has expressed interest in the field of emergency medicine. The physicians, members of the attending staff at the Rhode Island Hospital Emergency Department, worked closely with the students in examining issues related to the field, from the perspectives of doctor, student, and patient.

was 3% African American, 66% Caucasian, 6% Hispanic, 22% Asian, and 3% other. Of the Brown students, the distribution was 6% African American, 52% Caucasian, 3% Hispanic, and 39% Asian. The Boston students reported a total of 11 needle sticks, one of which contained blood known to be HIV positive. Two Boston students reported open wound exposures to HIV-positive blood. Brown students reported a total of 17 needle sticks, one of which contained blood known to be HIV positive. Two Brown students also reported open wound exposures to HIV-positive blood. The ranking of specialties in order of risk of HIV exposure is shown in Table 1. Because of the small sample size, differences between students' responses to survey questions 10-19 could not be determined, but certain trends are reported.

Table 1.—Composite Specialty Rankings by Institution

1—Greatest Risk of Infection
12—Least Risk of Infection

Rank	Boston University	Brown University	Total of Both	Johns Hopkins
1	Surgery	Surgery	Surgery	Emergency Med.
2	Orthopedics	Orthopedics	Orthopedics	Surgery
3	Emergency Med.	Ob/Gyn	Ob/Gyn	Ob/Gyn
4	Ob/Gyn	Emergency Med.	Emergency Med.	Internal Med.
5	Anesthesiology	Anesthesiology	Anesthesiology	Anesthesiology
6	Internal Med.	Internal Med.	Internal Med.	Pathology
7	Family Med.	Family Med.	Family Med.	Pediatrics
8	Pediatrics	Pediatrics	Pediatrics	Family Med.
9	Ophthalmology	Ophthalmology	Ophthalmology	Dermatology
10	Pathology	Pathology	Radiology	Radiology
11	Radiology	Radiology	Radiology	Psychiatry
12	Psychiatry	Psychiatry	Psychiatry	Ophthalmology

Discussion

As might be expected, more students attending the Boston University School of Medicine felt that they had adequate clinical experience dealing with HIV-positive patients when compared to Brown students. Most students agreed that a risk of contracting HIV did exist when treating certain patients. In addition, students perceived a greater risk of contracting HIV when treating homosexuals and intravenous drug users. However, our data suggest that HIV risk does not effect specialty choice among fourth year medical students at the two institutions surveyed. Nor has it influenced the students' choices of practice location or the types of hospitals at which residencies will be completed.

The data also revealed some interesting and disturbing numbers. Even though the sample sizes were small, it was evident that a significant number of needle sticks did occur at each medical school. Some were known to have been true exposures to HIV. Whether more education is needed regarding proper procedures and techniques for handling blood products is not clear and is a subject for further study.

Conclusion

HIV transmission to health care workers is very uncommon, but represents the ultimate threat to this group of individuals. Medical students are intimately aware of the dangers of HIV infection and the precautions that need to be taken in order to minimize risk of contact with infected body fluids. The encouraging results of this pilot survey indicate that medical students about to complete his/her education and enter residency do not feel that his/her choice of specialty was influenced by his/her perceived risk of contracting HIV, or his/her attitudes toward HIV infected patients.

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Brief Essays by Brown Medical Students

Clinic

Joanne Wilkinson, MD

Joanne Wilkinson, a native of Providence, RI, received her MD from Brown in May 1995. She is currently a resident physician in Family Medicine at Memorial Hospital of Rhode Island

Ten weeks down in my surgery clerkship, two to go. I am so beaten, so exhausted that I can't even walk fast anymore. Traversing the parking lot on the way in to the hospital today seemed like crossing the steppe, staggering twice as I labored to reach my once-a-week primary care clinic. Normally anything that gets me away from the drudgery of the OR is anticipated, but by now I am so whipped that just arriving at clinic was a monumental effort. The depths of my fatigue has reached the point where I am too tired to complain. I stare blankly at friends who wish me well in the elevator, trying to place them. I fall asleep at home with the lights blazing and the doors unlocked. If we get an admission after four I want to cry, but I can't muster up the energy.

"Here she is, our little bundle of joy," one of the residents says as I shuffle into the conference room. The medical interns are tired too, but largely happy—drinking gourmet coffee out of paper cups from the hospital's upscale croissant joint, crossing off the day's tasks on their lists, conferring by phone with the specialists who are seeing their patients in consultation. They have interesting jobs, they don't have to stand stock-still for 6 hours at a time hauling on a slippery retractor and trying to recall how many days ago their last meal was. After I plop into one of the straight-backed chairs at the conference table they go on telling the story they had started, about a patient in the unit who developed ICU psychosis and got as far as the automatic doors, but couldn't figure out how to open them by pressing the plate on the wall. "It was change of shift, and it was someone's birthday," the second-year says. "We were all eating coffee cake in the lounge. It was the maintenance man who noticed he was flying the coop." They all laugh, young vital people in their 20s who have chosen to postpone the rest of their lives so they can prevent crazy nut-cakes from leaving the unit at midnight.

"Your first patient is here," one of the medical assistants tells me, tossing the chart on the table in front of me. It is large and very thick, a patient I haven't seen before. It figures. I was kind of hoping everyone would just cancel today. I consider opening it and trying to read about this person who is waiting for me, but the task seems too momumental. "Oh..." I can't even come up with an expletive good enough to convey my state of mind. "God," I wind up sighing,

My patient is a very skinny man in sunglasses and a wheelchair pushed by his sister. I instantly regret not reading the chart. There is something very wrong with this guy—tertiary syphilis maybe. He's twitching like crazy. I try to shake his hand, and then wind up directing most of my greeting at the sister, who looks at me like I'm the last human being on earth after the holocaust. This is going to be good. I'm going to have to sit down for this one. I realize, dimly, that I was so tired after slugging across the parking lot that I forgot to eat lunch. That makes breakfast yesterday my last meal.

"It's really nice to meet you," I tell the sister. "You guys have been coming here for a long time?" I heft the chart in my hand so she knows from whence I speak. "But I haven't met you myself, so I need to ask you just some basic things about your brother's medical history."

"He has some disease," she says anxiously. "I don't know what it's called, but he ain't going to get better, that's what they told us. It runs in the family or something."

I flip through the chart until I find the neatly typed, dictated neurology notes. "Forty-year-old male with Huntington's disease," one of them begins. Huntington's. These facts permeate my sleepy brain as I look more closely at the man, his arms twitching aimlessly in an asynchronous dance. The autosomal dominant chorea that we all memorized as first-year students in genetics class. Woody Guthrie. It comes back to me in a rush. I would have paid good money, back then, to see a real live patient with advanced Huntington's, would have thought it fascinating. Now here he is, a living exercise in physical diagnosis, and all it is is unbearably sad.

"How has he been doing lately?" I ask softly, focusing better on the sister, stalling till I can figure out what to do. The patient has made no move toward me, given no indication that he understands. I will speak instead to her, reassure her, and if he hears us, he will know we care.

"Bad," she says, tears rising up in her eyes. "That's why we came. I can't take care of him no more. I just can't do it. I try, oh God, I try, but lately..." She shakes her head. He can no longer walk, dress himself, feed himself. He is incontinent. He goes into rages and strikes her, once knocking her against the bathroom mirror. She has small grandchildren at home that she also has to care for. She doesn't know what to do now, but she has brought him here to me today, in hopes that I can work a miracle.

"He's lucky to have you," I tell her reassuringly. "It sounds like you've done a great job taking care of him at home for as long as you could, but no one expects you to have to keep this up forever. What I can do" —it comes to me, suddenly, that this is what she wants — "is try to make arrangements for a nursing home, and in the meantime get a visiting nurse to come by and help you out at home."

"I know he probably doesn't want to go to a nursing home," she says guiltily, clenching her hands together in her lap.

"No one likes the idea,"I say, "but they would know how best to take care of him there. They're very good at it, and you'd visit him often, I know." "Oh, every day," she says. "Oh, doctor, I feel bad."

ABBREVIATIONS USED

AIDS: Acquired immune deficiency syndrome
CAT: Computer tomography
ER: Emergency room
ICU: Intensive care unit
ID: Identification
IV: Intravenous
NPR: National Public Radio
OR: Operating room
PLME: Program in Liberal Medical Education
UPS: Undergraduate PLME Senate
VA: Veterans Administration

"I understand,"I say, taking her hand. "You've done a great job, taking care of him this long at home. I know he appreciates it, even if he gets confused sometimes."

"Where's he going to go?" she wants to know.

"I need to make some calls," I say. "Okay? Then I'll come back and we can talk about things in more detail. Can you guys hang on a few minutes?"

"We've been hanging on all these weeks, a few more minutes is okay," she says tremulously, grasping her brother's hand and bringing it up to her mouth to kiss it.

In the conference room I am guided through the maze of paperwork one needs to make a referral to an "extended care facility." One of the questions asks whether the patient is expected to live longer than six months. I write, "no," then look at it for a long time. If I write it, will it happen? Am I wishing an early death on him? But what would be better, really, at this point? Best that he should code today, in clinic, before things get really bad. I am reminded, in these philosophic riddles, that he needs a code status, preferably before the nursing home. God forbid this poor guy gets intubated by some overzealous resident in the ER who sees his age and goes for the big save, the night he finally stops breathing.

Mary, the nurse on my team, gets on the phone to several area nursing homes. She is a wide-eyed, efficient person who always seems to be doing three or four simultaneous tasks, but is never overwhelmed. "Barbara? Mary," she says in a familiar way to the second place. "I'm doing all right. Yourself? Well, I'll tell you what's up. I have this guy in the clinic, he has Huntington's disease? Yeah. No, it's a neuro thing. Pretty rare...yeah, progressive. He's in a wheelchair, can't care for himself anymore, incontinent...Right. Yeah, he's going to die." She looks at me for some help, and I shrug: I don't know when. "I wouldn't think more than a year," she says smoothly into the receiver. "Okay, you look at your list. Well, the thing is, they just can't care for him anymore . . . OK, I'll make you a deal. "I'll wash your car if you can get him in by next Saturday. Well, when do you think she's going to die? Well, how about we make him next available bed then? . . . It'll have to be." She cuts her eyes to me; I'm nodding enthusiastically: "OK with the doctor. She's doing them now. Good. Here's their number." She reads it off from the front page of the chart. "Any meds?" she asks me. "I'm going to start him on some Haldol," I say. "For agitation." "Just Haldol," she says into the receiver. "Yeah. Barb, thanks." "You're washing her car?" I say in disbelief when she hangs up. "Whatever it takes," Mary says with a shrug.

The sister is weeping. I have just explained the nursing home situation to her and she cries in guilt and relief and exhaustion. "I'll get you some help over the next week or so, until they're ready for him," I say, rubbing my eyes. "Now there's a few other things I need to talk to you about. Does your brother have any kids?"

"Two," she says. "He never sees them."

"Well, here's the thing. This disease he has runs in families. So his kids have a fifty-fifty chance that they could develop it too. There's a test that they can take, if they want, to sort of detect it early. How old are they?" "Eighteen and fifteen," she says after calculating a moment.

"Well, they have time to decide,"I say. "But maybe you could have them come in and see me. We can talk about it together. How about you guys? Did you and your other brother ever get tested?" "No," she says.

"And how old are you now?"

"Forty-nine," she says. "My brother's forty-six."

"Okay," I tell her. "This disease usually comes on in the thirties, or early forties, so I'd say it's less likely that you'll get it. But if you want to get tested . . ."

"I'll talk to my brother about it."

"Fine. You can call me, if you have any questions about that part of it," I say. "The other thing I wanted to bring up with you was how much you want done for your brother if he gets real sick." I rest my hand on his knee as I say this, in case he can hear. "I don't think that's going to happen soon, but I also don't think he has a real long time to go. And because he's young, you know, people will be very willing to say, okay, let's do everything, and they may not know how sick he really is . . ."

She considers this. "Oh, we don't want him to be kept alive, you know, a vegetable or anything like that," she says tentatively.

"So, like, if he were to stop breathing, or his heart stopped, you wouldn't want them to try to bring him back? Or bring him to the hospital?"

"Um...I guess not," she says softly. "I feel real bad about this. I wish he could tell me what to do."

"Well, you can try to think about the kinds of things he would have wanted back when he was still talking to you," I say. "You know your brother better than anybody, so you're really the best person to make that decision." She looks back at me anxiously.

"Okay," I say, taking charge. "So you don't want them to do anything heroic, like putting a tube down his throat if he stops breathing, or trying to keep him alive past the point where he's really . . ."

"Exactly," she says, relieved to have this conversation over with. "I think that's good," I tell her. "You do?"

"Yes."I would say this regardless of her choice, of course, but I really do happen to agree with her, so it's easier. "We'll make sure that the people in the nursing home know that too, so everyone's in agreement. Okay?"

"Okay," she says.

We meet at the desk in the waiting room on their way out so I can give her the Haldol prescription and the phone numbers for VNA and the nursing home. It is almost four. I notice, somewhere from the fog that has permeated my brain, that my other two patients for today didn't show. A very good thing too, as all I want right now is to go into the conference room and put my head down on the table and sleep for about 16 hours.

My patient conducts invisible symphonies from his chair as his sister watches him in undeniable sorrow. When I hand her the nursing home papers she begins to sob, and I think for a moment that her guilt at having to place him there will overcome her. Then I realize they are tears of relief. When she hugs me, in a sudden impulsive goodbye, she all but squeezes the life out of me. "Doctor, I can never thank you enough for this day," she whispers.

I get my knapsack from the conference room and check twice to make sure I have my keys—they have a surprising habit of disappearing when I am post-call. As I leave, the secretaries all tell me how bad I look, something they've adopted during my surgery rotation. They give advice on what I should do to feel better—hot bath, square meal sleep, a massage. At this point remaining upright until I get to my car sounds like challenge enough.

Downstairs, I veer into the coffee shop before I go, deciding that a bagel is a good idea. If I can find the change in my pockets. If I can find my pockets. In the mirrored window behind the cashier I catch a glimpse of the doctor my patient saw, the one who found a nursing home for her brother. I realize that when he dies, it will be this day she remembers most, the day his death became a reality for her. The memory of the doctor who helped her decide will stay with her till the day she dies. Today I have been in the eye of someone else's hurricane.

I pay for my bagel and start to eat it slowly as I put one blood-spattered clog in front of the other on my way out the door.

AIDS Clinic at the ACI

Madassir Khawaja

Modassir Khawaja received his undergraduate degree from Brown University and is a resident of Providence. Currently he is a second year medical student at Brown and is interested in surgery.

In prison, no two doors ever open at the same time. It is 9:00 AM and I am waiting to

enter the High Security Unit of the Adult Correctional Institute. My bag is searched as I walk through the metal detector. As I approach the first set of doors, the guard looks at me suspiciously. I square my jaw and frown as if I belong here. He gives my ID a cursory look and exchanges it for a visitor's pass. The ID serves to keep track of the staff inside in the event of a riot.

The first set of doors opens. I am now standing in the "dead man's zone," a window-less corridor between two check-points. As the door locks behind me, I feel trapped as I wait for the next door to open. In the month that I have observed this place, this ritual has never changed. After the relatively minor crimes of the patients in the low and medium security AIDS Clinic, I am restless. I have been anticipating this day for a long time. Three check points later I am in the infirmary, a small cinder-block room cluttered with supplies and aging equipment.

The first patient is brought in from the waiting area, shackled hand and foot. I know from the nurse that he is a murderer, and I read from the chart that he has AIDS. The doctor asks the guard to remove the handcuffs and to give us some privacy. Having been ordered to keep the prisoner in direct view, there is an awkward moment before the guard retreats to his post behind the glass door.

The patient has been in the prison for most of his adult life — he is not much older than I am. He is lean and strong despite his infection. He is not intimidated as he sizes up first the doctor, then the nurse, and finally me. This patient has an interesting history. Ten years ago, as a nurse approached his cell to give him his food and medication, he grabbed her wrist and violently pulled her arm through the bars. The nurse was injured, and the prisoner has been considered irrational and dangerous ever since. Now, when a nurse approaches his cell, he is forced to stand against the far wall, with his back to the door and his hands over his head.

He settles himself on the examining table and begins his tirade. He is angry at this new indignity. With terse and well-chosen words he describes, convincingly I think, why he should not be treated like an animal. He demands that he receive his medication like every one else. As he is non-compliant, he takes his medications erratically. The nurse refuses his request and reminds him of his record. She falls back to the classic, "You can't have special treatment. You have to remember you're in prison." I don't think he has forgotten.

Unable to sway the nurse, he turns to the doctor and then to me, not realizing that I am only a medical student. He insists that his health and welfare are her responsibility. The doctor, of course, is no more able to remedy his circumstance than to cure his infection. There are others waiting outside. As he is led away, he looks somehow smaller as the door closes behind him.

Student as Patient: Perspectives from the Other Side

Allen L. Hsiao

Allen Hsiao is from Baltimore, MD, and has been studying at Brown for the past 6 years. He received his bachelor's degree in biomedical ethics in 1994 and is currently a second-year medical student at Brown. He is interested both in pediatrics and emergency medicine.

Murmurs exude from the many people in the crowded room, the background noise punctuated by a woman's coughs. The raspy wheeze of another as he breathes accentuates the grumbling. One strains one's ears, yet hears no laughter. In the background, cries of small children can sometimes be heard, distant, yet disconcerting. Electric doors slide open; they slide closed. The winter night is denied entrance, doors shutting on its fingers of chilled air. Those sitting nearby shiver in response and huddle closer to loved ones. But the doors never remain shut for very long and the seats in the middle of the room are the most in demand. People in white bustle in and out, some of their captive audience almost trying to cling to them, begging for information, for help, for hope. Through the din, I hear my name called. A woman in white beckons to me and wearily, I rise to my feet in response.

She asks what is wrong with me, and I repeat what I had told the first lady who asked the question. There is numbness in my left hand and upper lip, there's shimmering whenever I open my eyes, and there is pain behind them. She nods knowingly and writes it down, as the first woman did, except this time, I'm not asked for insurance information. My temperature is taken, then my blood pressure. I'm told to return to the room to wait, and I do as I'm ordered. My friend, who brought me to the ER, smiles and pats me on the back reassuringly, though she looks neither happy, nor assured. In fact, she seems worried, as well as tired and drained, but it is to be expected at 1 AM. Minutes go by, some people leave, others arrive. Every so often a name is called and another is allowed to leave the waiting room and enter the actual emergency room. After some time, it is my turn.

A nurse hands me a gown and tells me to change into it as she whisks the curtain shut. As I remove my clothes, I shiver and wonder why the sick should have to take off their clothes when it is so cold. The blue lights above the bed, I conclude, have nothing to do with heating the room. Feeling quite insignificant in only my briefs and borrowed open-back gown, I lie down on the gurney. Closing my eyes, I try to ignore the symptoms I had been feeling, as well as the room around me. Before I achieve much success, an ER technician pokes his head through the curtains and enters. He smiles and makes conversation. He's friendly enough, so I offer him my left arm, into which he expertly inserts an IV needle; it doesn't hurt as much as I expect. He leaves and I lie back in bed, experiencing one of my first IVs. The cool fluid is strangely relaxing; as the bag of normal saline drains into my circulation, I begin to feel better and start to question if I should even have come to the ER. My anatomy final is only two days away and I really should get back to studying.

Before I can seriously consider leaving, the doctor assigned to me parts the curtains and steps into my once protected space. I feel an immediate sense of relief; here is someone who knows more than I and will figure out what is wrong? We talk, and I explain my symptoms again, but this time to him. Who gets all of the notes the nurses took, I wonder. He tests my reflexes, then my ability to follow his finger with my eyes, then the strength of my limbs. I am to push against his hands, as they move inward and outward, side to side. Groggily, my mind reminds me that he must be doing a neurologic exam; I'm sure I just read about them somewhere. Everything checks out okay he tells me, although he is still concerned about the numbness I felt, as well as the eye symptoms. Me too, I think to myself, but I don't tell him that it was my fear of a subarachnoid hemorrhage that brought me to him. I have many of the symptoms that I just presented in an anatomy prosection a few days ago. He orders a CAT scan but warns me that I may have to wait a while; there is no technician working that night and one is being called in. I feel badly that I might be the sole cause of someone losing sleep (my friend, too) but instead of protesting, I settle back into my bed and wait. Exhausted, I close my eyes.

My introspection is interrupted by a nurse swishing the curtain open and announcing that the technician has arrived. Another nurse is behind her, pushing a wheelchair. A wheelchair?! I'm told it's safer and hospital policy to wheel me to the CAT scanner; once again, I do as I'm told. Awkwardly, I climb in and the nurses help by keeping my IV line from tangling. One of the nurses hands me my IV bag to hold while the other pushes me to the imaging section of the hospital. An otherwise healthy 22-year-old who enjoys running, I feel ridiculous and quite humbled.

The radiology technician greets me and pushes my wheelchair against the CAT scanner. I'm helped onto the built-in bed; it's very cold, especially where my gown is open in back. As I lie back, staring into the red dot that is projecting onto the ceiling, everything feels very surreal. The technician, having retreated behind her protective cubicle, sounds not unlike Darth Vader when she speaks to me through a speaker. "Try not to move," admonishes the distorted voice, so I don't. After ten or fifteen minutes of humming and whirring, I'm helped back into my wheelchair. X-ray sections of my brain, no doubt, are being rushed somewhere to someone.

Finally, the doctor brings me the good news. The CAT scan was absolutely normal and what I experienced was probably a type of migraine, even though I had never had one before. He explains to me about spastic vessels behind the eye, visual disturbances, and transient numbness as a result. After giving me a prescription and a pat on the back, he encourages me not to get stressed and to avoid stressful situations. I think about asking him whether medical school counts, but I decide against it. I thank him for his dedication and diagnosis, relieved that my first-year-medical-student-disease-paranoia turned out to be just that. Even when you know about it, you're not immune to it.

It never seems to fail, whenever exams roll around and things get really stressful, I always seem to get sick in some way. Instead of just berating my seemingly frail body, I struggle to look at my sicknesses constructively; perhaps God is teaching me a lesson. It's all too easy to lose perspective and obsess about grades and honors, to worry about residency, fellowships, etc.. Health, the fragile commodity that my classmates and I are learning to preserve, can elude even us young physicians-to-be. What more powerful lesson can one learn than to enjoy one's good health when one has it? Life, if one really thinks about it, is too precious a gift to waste on just stressing out.

In addition, I realized from my unplanned trip to the ER, just how humbling and overwhelming it can be to be a patient. Roaming the hospital just a week earlier, I felt like a big shot with a tie and my official medical school nametag; being pushed around in a wheelchair and dressed in a gown was a decidedly different experience. Although I learned an incredible amount of information during my first semester of medical school, perhaps the most important lessons I learned are to enjoy one's good health and respect those who have lost it. Some liken doctors to mechanics; that may be so, but we must not forget that like ourselves, those we try to fix have souls, too.

Student Innovations in the Training of Physicians at Brown: the Whole Patient and the Whole Physician Programs

Ari Blitz

Ari Blitz was born in Cheshire, CT. He is in his senior year of undergraduate study in neurosciences and plans to attend Brown Medical School in the following year. He collects books, turn of the century medicine bottles, and is interested in the history of medicine, poetry, computers and the evolution and structure of the human brain.

In the wake of the 1910 Flexner Report the emphasis of medical education shifted heavily towards technical expertise in treating disease to the exclusion of what may loosely be termed humanism. Such was not the intent of the original document. Some years after Abraham Flexner's Report was published, sensing that what had begun as a much needed palliative to professional schools lacking in scientific expertise might lead to a profession almost detached from the humanity of the patients it serves, he was moved to write: "It is equally important, and equally possible for physicians of all types to be humane, and at the same time to employ the severest intellectual effort."[1] Flexner viewed scientific education alone as insufficient and potentially dangerous.[1] He seems to have come to the conclusion that compassion could be taught as readily as chemistry.

Medicine has increasingly come under attack. A profession whose members were once viewed almost with reverence has come to be regarded as largely a technical endeavor. Perhaps to some extent this is accurate. In the past one hundred years the change in medical technology has been staggering. The training of physicians has become correspondingly more technical. Yet it has been long supposed that compassion and technical skill are mutually exclusive. At least in the eyes of Flexner and some recent scholars, they are not. For this reason Flexner held the "strong belief that the humanities must be in dialogue with science and that the proper locus of that dialogue is the university [and M]edicine for this reason has particularly to be a university discipline." Brown is almost unique in the degree to which it allows its students to benefit from this relationship. Its Program in Liberal Medical Education (PLME), an eight year continuum culminating in both a bachelor's degree and a doctorate in medicine, encourages students to maintain wide interests and to "view medicine as a socially responsible human service profession" (*Medical Education at Brown University* forward). During the first 4 of the 8 years in the PLME students are enrolled full time in the undergraduate college with only minimal premedical requirements. In the words of Dean of Medicine and Biological Sciences Donald Marsh "eliminating the distinction between the Medical School and the broader University" is seen as central to the task of educating doctors well at Brown. The assumption is that broadly educated physicians will be more compassionate, better doctors.

Although in their last years of undergraduate training students can become quite involved in medically related subjects, traditionally students have had little structured contact with the PLME during the first two of eight years in the program. When the Undergraduate PLME Senate (UPS) was created during 1993-1994, one of the strongest sentiments was that this lack of contact

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with a program meant to integrate smoothly undergraduate study with a career in medicine (or at least to allow for peaceable coexistence) was counterproductive. Students who decided before entering college to become doctors, are likely also to be students who would welcome the opportunity to get an early glimpse of the field they are soon to enter. For this purpose the UPS has now developed and implemented one program, the Whole Patient Program for first year students, and is in the midst of developing another for sophomores, the Whole Physician Program.

The Whole Patient Program brings together all first year undergraduate students and their physician advisors on a monthly basis to be presented with a patient's case by the patient and his or her physician. The program is intended to acquaint the student first hand with the nature of suffering and disease through the differing lenses of first the patient and then the physician. By asking real patients to come in to present we aim to provoke a strong emotional reaction in the audience. By asking the patient to speak about both how their disease has affected their lives and the lives of those around them we aim to place the disease of the patient in a broad social context. By asking the patient's physician to speak we have tried to provide an early introduction to clinical thought processes. Michele Cyr, Alan Erikson, Edward Feller, David Carter, Paul Alexander and their patients generously volunteered their time and gave stirring presentations. The patients we met spoke at length, often very eloquently, about how AIDS or anxiety disorder for instance affected their lives. The final lecture of the year was given by Dr Milton Hamolsky who gave an inspiring lecture generalizing from the five patients we had previously heard about to the many patients he has seen during his career. We have devised a set of surveys given to students and the staff after each lecture to monitor our progress.

Just as the first undergraduate year program is intended to lead students to view disease states as part of a larger picture, the second year, the Whole Physician Program, will invite the student to contemplate the medical role of the physician within the greater context of his or her life. Medical students, interns, residents, and practicing physicians will be invited to speak monthly on areas of interest to them. Residents who maintain interests outside of medicine carry these interests with them throughout life. Interns who establish good habits of self directed learning will have the discipline to take time out of their schedules and keep up to date in the medical literature. Physicians who write poetry, raise families, drive racecars, bungee jump, spend time in China, or run marathons for instance may be of especial interest as they have chosen to and have been able to balance their lives in interesting or exciting ways. It is our belief that introducing such role models early on will be of benefit to the student in the long run.

It is no accident that we have structured the progression of the programs in such a way as to introduce the student first to the object of their studies and then to the training needed and ultimately to the lifestyle of members of the profession. It is our belief that an introduction to the lives and emotions of patients as a valid subject matter for study is a legitimate first step in educating the compassionate and technically skilled physicians Flexner envisioned.

Reference

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At the VA: Through the Eyes of a Medical Student

Catherine McLean

Catherine McLean is a fourth year medical student at Brown University. She graduated from Oberlin College in 1988 with a degree in English literature, then supervised a family planning and HIV training program with Planned Parenthood, San Francisco Bay region, before attending the post-baccalaureate pre-medical program at Bryn Mawr. She is interested in HIV infection and international public health.

The light flashed green, and I drove through the intersection towards the red brick building which arced above me, prominent upon the hill overlooking Davis Park. The American flag waved before the pillared entrance. I turned into the drive, careful not to exceed the strict 15 miles/hour limit, nodded as I rolled past the security patrol, and parked across from the emergency room entrance

I studied the scene before me as I listened to the end of the morning news on NPR and sipped my coffee. Whenever the sliding doors opened, I could see two men, each dressed in a blue and white hospital gown and sitting in a wheelchair Just inside. Apparently not together, they sat at a comfortable distance, taking long, synchronized drags off their cigarettes, watching the scene open and close in front of them. I wondered how time passed for them there and how many days each had sat at that particular place. Every time the doors opened I caught a glimpse of these two silent companions, side by side, and. watching. One young, bearded man wore a baseball cap secured just above his ears. His head hung low, while his elbows, planted on the arms of the wheelchair, supported the weight of his upper body. I wondered why he was in the hospital, how long he had been there, if he had children. The other, a frail, elderly man, slumped back in his seat, an IV pole at his side and forgotten oxygen tubing hooked over his ears and under his nose. He tapped the ashes and took another long pull from his cigarette. What war had he been in? Was he awaiting someone's visit? Was there a "someone" to visit?

I was nervous about working at the VA. I had images of what it would be like: a predominantly male population with heavy smoking and alcohol abuse histories, who would be less than easy to work with and who were sick... really sick. And how would my patients and the staff respond to me? The doors opened again and another puff of smoke billowed up into the cool air. I slipped

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into my fresh, white lab coat, pockets weighed down with all the necessities which immediately identify one as a third-year medical student— quick references, reflex hammers, pen lights, tuning fork. I draped my stethoscope around my neck, took a deep breath, and marched towards the puff of smoke ....

The entryway smelled stale, nods and morning greetings followed, and I felt self-conscious of my white coat, my youth, and my inexperience. The younger of the two smokers had presented with abdominal pain which had become increasingly intense over the past several months. On CAT scan he was found to have extensive liver metastases, from advanced cancer. His liver had circular spots scattered throughout, "looking like Swiss cheese,"as the radiologist described it. He suffered from post-traumatic stress disorder and had been severely depressed since returning from Vietnam. He awoke several nights a week with vivid flashbacks of an episode in which he had witnessed another man killed. He had been a tank driver.

We looked at the CAT-scan, together, and I explained to him that he had a late stage lung cancer. He looked at me with sad eyes—eyes sad for many years—and asked, "Would you talk with my family?" And then, "Can you show them the pictures?" He half-smiled, then turned and walked down the hall to pick up his cigarettes and return to his post in the entryway. That evening I met his family at the desk—his wife, 12-year-old daughter and 10-year-old son. We talked, and again stood in front of the pictures of their father's liver, and I explained what can happen to young people. "Your father may live only a few more months." *This must be so hard. You are so young to have to hear and understand this.*

"Your father is a special man. He will need you to be strong for him." Another patient I met in the ER, a 72-year-old man who came in because the back pain he had had for several months was increasing so that he had not left his house for the past few weeks. He had begun to lose weight and, finally, came to the .emergency room because the pain was keeping him up at night. He lived alone, had never married, and had no children or immediate family. He had had a younger brother who was mentally retarded and whom he had cared for his entire life until he passed away earlier this year. He was found to have a widened mediastinum on chest x-ray, confirmed by CAT scan to be a large thoracic aortic aneurysm. "It's like a garden hose with high fluid pressure causing a bubble to bulge out the wall. It's dangerous. It could burst at any time." We placed a central line, typed and crossed six units of blood, and moved him to the ICU.

"What does this mean? Can it be fixed? I want everything done." A thorough evaluation suggested an 80% risk of mortality with surgery. He was found to have a large intraluminal clot waving back and forth with each pulse of his heart. The surgeon reviewed his films with me and explained the limited options this patient faced, and we explained the situation to him. "You are very ill. We would like you to stay in the hospital where we can treat and closely monitor your blood pressure."

I watched as this spirited, independent man who had never before been in a hospital, listened to what we had to say about the likelihood that he could die at any time. I knew he was contemplating getting dressed and walking back out the front door to catch the bus home and have his life end as fate would determine, without intervention.

We started the medication, and his blood pressure dropped. The next day he was confused, most likely a side effect of the potent drug we were administering. Later that day he became completely disoriented. I stopped by several times a day, watching his blood pressure, measuring his hematocrit, hoping he would improve.

He received excellent attention from the team in the ICU, as did I. Each day after I examined my patient, the fellow reviewed the plan with me, making suggestions, asking me questions. I presented him on rounds in the morning, reviewing every system with a plan for each. When orders were needed, I was expected to write them. If others wrote orders, they were reminded that the responsibility was mine, and they would hand me the chart and help me de-

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cide. I spoke with the consults and transmitted the information. The nurses would notice things I had not, or think of things I did not, and make suggestions. They promised to call me with any signs of clearing. And one day, he began to clear. He was accommodating to his medication. Slowly his personality reemerged and one bright morning he turned to me and said, "I'd like a big plate of spaghetti, with extra garlic." We grinned at one another and knew we were through the worst of it.

Being introduced to the clinical wards - to real patients with real diseases - is an amazing experience. To see disease processes which until this time had been little more than pink and purple patterns on a slidescreen at the front of the lecture hall or to see drug side effects which declare themselves, now standing out from within the columns of fine print in my text is a little like being at Disneyland as a child. What have been distant, static images spring to life and become real, demanding attention and understanding. Getting to know people who have the diseases we have read so much about, learning about their lives, getting to know their families, is what makes medicine so fascinating.

The patients who work with medical students, the most junior members of the team, give of themselves for our training and understanding. We take a little longer completing the history and physical, are a bit of an inconvenience as we may repeat some or all of what has been done previously, and are, at times, painfully awkward in what we say or do. However, there is often an exchange - a transaction - which occurs. As students, we also offer something unique to our patients. We may take a little more time to listen to their stories, to talk with their families and to understand the context within which their disease is occurring. In a way, our limited medical understanding is our unique virtue. We are protected from allowing the person to become the disease because we don't fully understand the disease yet. We are relying upon the patient to fill in those gaps.

While this is an integral aspect of most medical training, the VA offers something unique in both the degree of pathology and the amount of responsibility offered to medical students. And it is the responsibility which stimulates learning. I read about my patients' diseases, I studied their EKGs, and I listened to what they were telling me every day because I felt that I might, just might, be able to make a difference in their lives.

As a medical student at the VA, I was an integral member of the treatment team. I was given responsibility, asked for my opinion, respected for what I offered. My misgivings about what the VA could be were left outside that sliding door. Inside, I was immersed in an education, through life stories and medical conditions, which extended far beyond the limits of the formidable brick building on the hill.

Lies

Paul Simmons

for Julie Anthony

Mother's lips pressed onto my forehead,
feeling the fever.
Soft and cool, like the petal-bloom of
some succulent flower.
"Tomorrow," she said. "You'll feel better
in the morning."
Bitter, crushed-up aspirin is all I'll have
to take.
"I will be better in the morning."

Those same mother's lips,
Now unslaked, suck at the white-green air
of the hospital room.
I lean forward and look through the
window of her eye.
Death is there:
A somber foetus, growing with each
borrowed breath.
Time's new friend.

When I was little, I believed that time was
on my side.
From now on, I'll know that his allegiance has changed.

Paul Simmons graduated from Amherst College in 1982 with a degree in English. In 1988, he took a Master of Arts from the School of Cinema-Television at the University of Southern California. In all, he spent 9 years in the motion picture industry as a freelance writer-director before pursuing a career in medicine. As a second-year student at Brown, he currently has no idea what specialty interests him most.

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Medical Students: Making a Difference While Learning

Lynn C. Epstein, MD

Given the privileged role of physicians in caring for their patients, how can students "become doctors" without placing patients at risk?

> For the things we have to learn before we can do them, we learn by doing them.
> Aristotle, Nicomacachean Ethics

By what process can medical schools assist students in their quest for competence and in their acculturation to medicine? Although it is well-accepted that the practice of medicine requires a combination of attributes, abilities and knowledge, the formula for blending these ingredients remains a subject of discussion.[1,2] National Board examinations and general licensure requirements expect all students to have mastered a large common knowledge base. Performance-based examinations, when they are used, extend what is required by asking students to demonstrate clinical skills and reasoning abilities. Since students eventually branch out in pursuit of different practice types and specialty areas after graduation, it is understandable that there might be an unevenness in the extent of student knowledge and abilities in specific, specialty domains. Given the privileged role of physicians in caring for their patients, how can students "become doctors" without placing patients at risk?

During the past decade, medical education has emphasized several learning strategies, among them: early clinical experiences to integrate basic science learning and new technological advances with patient interactions; active student learning to further vital student skills in problem solving, effective communication and resource utilization; a renewed emphasis on interpersonal skills and on empathic patient care; a shift of many student clinical training sites from hospital settings to outpatient and community settings; and an ever-increasing emphasis on primary care and community interactions. As students enthusiastically endeavor to become the best physicians they can, it is often early opportunities for mentoring and service which shape their later career attitudes.

Brown University has a special, integrated eight year continuum program, the Program in Liberal Medical Education (PLME), that permits continuity experiences across the undergraduate and medical school years. Within the PLME, the Affinity Group Program forms a four-year bridge across the last two years of college and the first two years of medical school. In the Affinity Group Program, students are matched with faculty in small groups around areas of common interest to pursue mentoring and active educational experiences. The problem based learning (PBL) hierarchy developed over the four year sequence includes traditional PBL "paper" cases, work with standardized patients, and an examination of the larger, community and societal aspects of issues addressed.

Common to all groups are the close ties that evolve among students and between faculty and students. The content areas vary according to prevailing interests, as there is not one central prescribed syllabus. Rather, groups are able to define not only their specific area of interest, but also, the nature and scope of their activities. Since instituting the program in 1987, it has become apparent that students and faculty, in half of the groups, seek out opportunities for structured learning experiences that have a community or service learning component.

Over the past 2 years, the Brown University School of Medicine has begun implementation of a new competency-based curriculum, MD 2000.[3] A major feature of the program is the identification of nine abilities in which all students must demonstrate competencies and mastery of the requisite knowledge base. In conjunction with MD 2000, affinity group faculty, students and consultants identified core abilities addressed by all affinity groups regardless of their interest area. Since the affinity groups span four years, groups typically cover more than one ability over time and may shift their emphasis from year to year. As a whole, affinity groups address abilities in Self-awareness, Self-care and Personal Growth (through mentoring); Problem Solving (through problem-based learning), and Effective Communication (through small group format and work with standardized patients). Many affinity groups also elect to address competencies in the Social/Community Context of Health Care, in Lifelong Learning, and in Moral/Ethical Judgment. This paper will explore student contributions to the community while learning within the Affinity Group Program at the Brown University School of Medicine and share student feelings about these experiences.

Learning by Seeing and by Doing

It is very clear from the breadth and depth of medical curricula and texts, that there is an extensive information base for students to learn during their studies. What may initially be less obvious is the significance of the attitudes, values and personal styles that are embodied. Just as children are influenced by the behaviors of adult family members, so students are affected by the priorities and actions of their faculty and role models.

Students frequently mention their appreciation of the time which faculty members devote to them. Affinity Group faculty make a four year commitment to working with students in two-hour time blocks, with a frequency of weekly or bi-monthly meetings, depending on the year and the semester. This generous devotion of their time to students (listening to what is going on in medical school; working through problem-based cases and activities; offering feedback on activities and progress; and assisting in the development and implementation of goals), helps to validate similar behaviors by students in their interactions with each other and with their patients.

Along these lines, the use of role plays and patient simulations during the undergraduate years, ensures that students, of necessity, focus on patients as people and come to appreciate the complex feelings associated with needing to consult a doctor. This understanding of the patient's perspective, and a parallel remembrance of how the patient's problems made them, as students, feel, helps students maintain empathy later in their education, when the demands of time and task are greater.

How can well-intentioned students make contributions to the community and to pa-

ABBREVIATIONS USED
PBL: Problem-based learning
PLME: Program in Liberal Medical Education

Lynn C. Epstein, MD, who is a Fellow in the American Psychiatric Association and in the Academy of Child and Adolescent Psychiatry, is Associate Dean of Medicine (Student Development and Women's Affairs) at the Brown University School of Medicine and Clinical Associate Professor of Community Health. Dr Epstein is currently Chair of the Group on Baccalaureate-Medical Degree Programs and President of the Association of Women Psychiatrists.

tient care? What do they have to offer? These questions are frequently voiced at early meetings of affinity group students with faculty. The answers, typically discovered by the students themselves, frequently surprise them both in terms of the number of ways they can be helpful and the degree to which their efforts yield tangible benefits to the individuals and groups they would help. When students give time and attention, it does make a difference. For patients and their families, students can assist them to sort out feelings and options and to find the courage to question, to speak up and to make decisions. For organizations, students can be the energy and resource to accomplish what may be obviously needed but might have previously been overlooked or ignored. Such activities span the gamut from patient education or advocacy to physical restoration of facilities or performance of routine services. Once students see the positive impact of their efforts, they typically become even more committed. Thus, early opportunities can develop the patterns for additional contributions later.

Moreover, the search of students for answers and their unwillingness to ignore a problem, makes them an especially valuable resource for projects and research. Student devotion to people and task can be the catalyst for addressing issues and finding answers.

Some Affinity Group Examples of Community Interactions

The thirty plus affinity groups from 1994-95 can be artificially grouped into four clusters according to their themes as follows: eight groups in the areas of public health, international health, cross cultural issues and primary care; eight groups addressing issues in doctor-patient relationship and the medical education process; nine groups in various specialty areas, e.g. women's health, research, emergency medicine, gerontology, surgery; and five groups in the area of ethics, medical controversies and health care reform. Over three-quarters of the groups had substantial contacts with patients, clients or family members in a clinical setting, ranging from shadowing and observing to discussions, interviews or surveys. Just under half of the groups were involved with community projects or services in such areas as health fairs, preparation of educational materials or surveys, health education programs, mentoring community middle school or high school students, or miscellaneous activities like walking for breast cancer or building renovations. A couple of more detailed examples follow.

A new affinity group for junior undergraduates defined its interest around working closely with the Chad Brown Health Center. The group started by becoming familiar with the center, its staff, clients and mandate. Students visited the center interacting with patients, shadowing physicians and assisting staff. The group queried the members of the center, did a mini-needs assessment, and researched issues of poverty, bias and cost in medical care. As the bonds between the group and the center deepened, the group actively sought ways to expand the resources of the center and to get much needed supplies. As part of the "Christmas in April" project, the center was painted. The group also applied for funds to support much needed Center services and plans to continue its activities at the Center over the next three years. Since this is the second affinity group to work with the Chad Brown Center, it is hoped that the ties between the Affinity Group Program and the Center will be passed along to other groups in the future.

An affinity group for senior undergraduates, was awarded an Upjohn Affinity Group Community Service Grant to fund the costs of a health fair for elderly residents of the Blackstone Valley Health Center. Another group in the area of emergency medicine, in the first year of medical school, investigated the impact of HIV on the residency choice of medical students. In addition, this group examined patients' experiences in the emergency room and is making an educational film to explain to patients the emergency room routine. One medical school group has been working with families of children with disabilities. Students have become advocates and resources for the families and establish a continuity relationship over time. Initially, the students felt reticent about possibly burdening the families and were surprised to realize how much the student contacts meant to the families. In a similar fashion, one of the first year medical school affinity groups worked with Hospice Care of Rhode Island, exposing students to the individuals and families in hospice care. The bi-directional nature of the interactions was quite evident from the writing in the students journals.

A second year medical school affinity group completed four years of a partnership mentoring adolescents in Central Falls. Brown students would visit in Central Falls and conversely bring Central Falls students to the Brown campus. The group exposed the adolescents to new experiences and challenges in an attempt to broaden the scope of their ambitions. In conjunction with an Upjohn Affinity Group Community Service Grant, the group took the students on an educational outing to a Boston museum and held an informational program for the Central Falls students and their parents. Other local schools have expressed an interest in establishing a similar mentoring relationship with an affinity group in the future.

Discussion

Affinity group activities are a combination of direct community service with academics and mentoring. Students have to plan and implement the projects, as well as, to collect, analyze and reflect on what they have accomplished and learned. As such, the value is as much in the process as in the product. Students learn through their experience, that to be really "helpful" they need to get input from the individuals and organizations that they want to help.

Activities in the community generally develop out of each group's initial interest and serve to frame what the group does. Having occasions to apply the theories and principles that have been researched are vital aspects of the affinity group experience. As one student said, "The things I learn and remember are the things I see and do."

Perhaps most striking, the enterprise gives genuine meaning to students' education, while motivating them to contribute more. The opportunities to learn by doing augment students' personal development, serve to further their understanding of individual and community well-being, and form the underpinnings of their ultimate professional careers.

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HEALTH BY NUMBERS

Rhode Island
Department of Health
Patricia A. Nolan, MD, MPH
Director of Health

Edited by Jay S. Buechner, PhD
Chief, Office of Health Statistics

Infant Mortality in Rhode Island

The infant mortality rate, which measures the number of infant deaths (ages–days) per 1,000 live births, is widely used as an indicator of maternal and child health, public health, and even social progress. Infant mortality is divided into neonatal (less than 28 days old) and postneonatal (28 to 365 days old) rates, which are indicators of pregnancy outcomes and of early child health, respectively. During this century, there has been a strong trend of declining infant mortality in the world, in the US, and in RI.

Methods

RI infant mortality rates are calculated annually from birth and death certificates and are based on place of occurrence, ie, the number of infant deaths and the number of live births that occur in the state, irrespective of state of residence. Rates based on place of residence, which require data on births and infant deaths that occur outside of Rhode Island to Rhode Island residents, are not available on a timely basis. (Note: Over the period 1984–1991, Rhode Island occurrence infant mortality rates have been 5% higher than residence rates, on average.) Infant mortality rates for the United States are based on place of residence. State and national data for the years 1992–1994 are provisional and subject to adjustment.

Race-specific infant mortality rates for Rhode Island are calculated using the child's race listed on the death certificate to determine the numerator, and the mother's race for the infant on the birth certificate to determine the denominator, in accordance with definitions established at the national level. Race-specific rates are presented only for the years 1990–1994 as data from prior years are not coded consistently with this period.

Results

Provisional vital statistics for 1994 show 82 infant deaths and 14,388 live births occurring in Rhode Island, for a provisional occurrence infant mortality rate of 5.7 per 1,000 live births. The low 1994 rate follows a 10-year decline in infant mortality at both the national and state levels. Since 1984, when the rate was 11.1 deaths per 1,000 live births, Rhode Island's rate has fallen by 49%. During the same period, the national rate has fallen from 10.8 to 7.9, a decrease of 27% (Figure 1).

Within Rhode Island's infant mortality rate for 1994, substantial disparities exist for sub-populations defined by race and ethnicity, with high rates reported for African-Americans and low rates reported for Hispanic-Americans. These disparities have persisted over many years, and the elevated rate for African-Americans has not declined relative to the white rate recently (Figure 2).

Both components of the infant mortality rate, the neonatal mortality rate and the postneonatal mortality rate, have been decreasing in Rhode Island during this period. In 1984, the occurrence neonatal mortality rate was 8.7 deaths per 1,000 live births; the provisional rate for 1994 was 4.2, a 52% decrease. During the same decade, there was a 35% decrease in the postneonatal mortality rate, from 2.3 to 1.5 deaths per 1,000 live births (Figure 3).

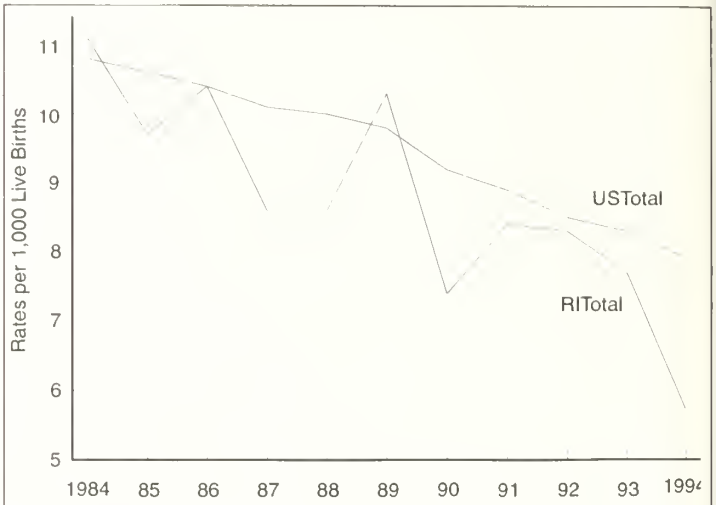

Fig 1.—Infant Deaths per 1,000 Live Births, United States and Rhode Island, 1984-1994

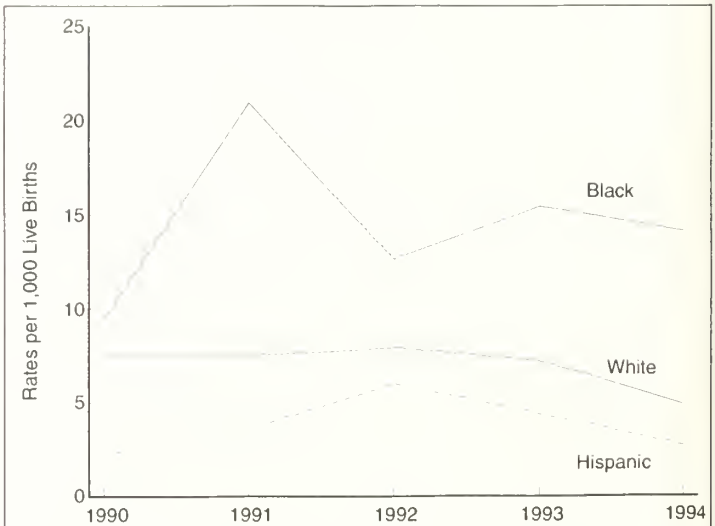

Fig 2.—Infant Deaths per 1,000 Live Births, by Race and Ethnicity, Rhode Island, 1990-1994

Discussion

The recent improvement in infant mortality has occurred even though the prevalence of low birthweight has remained stable. Low birthweight (less than 2,500 grams) is associated with 60% of all

Submitted by the Division of Family Health, William H. Hollinshead, MD, MPH, Medical Director, and Samara Viner-Brown, MS. Health by Numbers *is edited by Jay S. Buechner, PhD, and William J. Waters, Jr., PhD.*

newborn deaths. In fact, although very low birthweight infants (less than 1,500 grams) account for only 1% of all births in Rhode Island, they comprise over half (55%) of all infant deaths in the state; live born infants under 500 grams comprise almost 30% of such deaths. Extreme prematurity, with resulting low birthweight, is the largest contributor to infant mortality in the state. The excess of low birthweight and prematurity among African-Americans accounts for nearly all of the disparity between their infant mortality rate and the rate for whites.

Our declining infant mortality rates occur at a time of improved maternity care and rapid advances in intensive care for premature infants. The possibility of future reductions in infant mortality depends substantially on our ability to reduce the prevalence of prematurity and low birthweight in this and similarly disadvantaged populations.

Data Sources

Rhode Island: *Maternal and Child Health Data Book, 1987-1991*, Division of Family Health, Rhode Island Department of Health; and Office of Vital Records, Rhode Island Department of Health.

United States: *Monthly Vital Statistics Report* 43:12 (and previous issues), National Center for Health Statistics, United States Public Health Service.

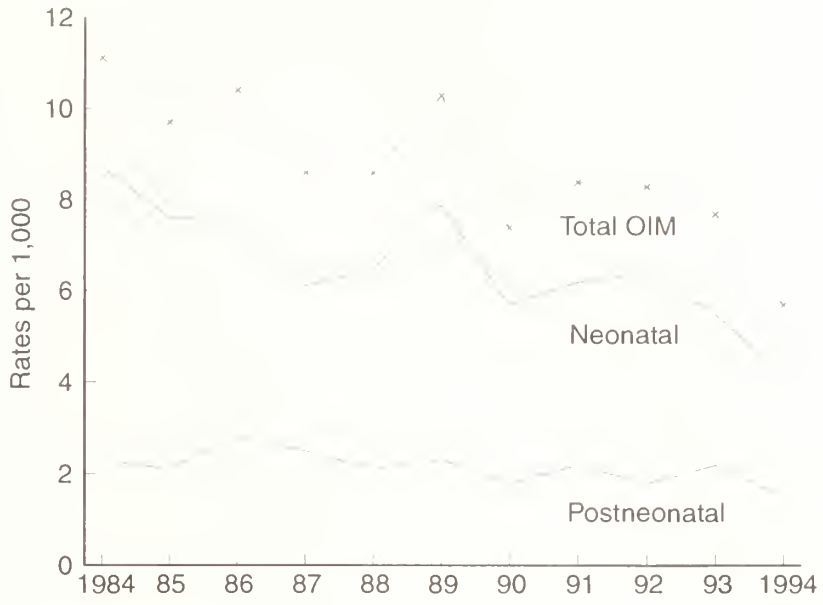

Fig 3.—Neonatal and Postneonatal Infant Deaths per 1,000 Live Births, Rhode Island, 1984-1994

Rhode Island Monthly Vital Statistics Report

Provisional Occurrence Data from the Division of Vital Records

Patricia A. Nolan, MD, MPH
Director of Health

Roberta A. Chevoya
State Registrar

Vital Events	Reporting Period: June 1995 Number	Reporting Period: 12 Months Ending with June 1995 Number	Rates
Live Births	1082	13,983	14.0*
Deaths	703	9,619	9.7*
Infant deaths	(6)	(83)	5.9#
Neonatal deaths	(5)	(63)	4.5#
Marriages	809	6,908	6.9*
Divorces	397	3,446	3.5*
Induced Terminations	482	5,811	415.6#
Spontaneous Fetal Deaths	84	1,011	72.3#
Under 20 weeks' gestation	(80)	(936)	66.9#
20+ weeks' gestation	(4)	(75)	5.4#

*Rates per 1,000 estimated population. #Rates per 1,000 live births.

Death Category	Reporting Period: Dec. 1994 Number (a)	Reporting Period: 12 Months Ending with Dec. 1994 Number (a)	Rates (b)	YPLL (c)
Diseases of the Heart	318	3,215	322.7	4257.5
Malignant Neoplasms	192	2,399	240.8	7381.5
Cerebrovascular Diseases	55	593	59.5	652.5
Injuries(Accident,Suicide,Homicide)	31	332	33.3	6698.5
COPD	30	356	35.7	205.0

[a]Cause of death statistics were derived from the underlying cause of death reported by physicians on death certificates.
[b]Rates per 100,000 estimated population of 996,325.
Note: Totals represent vital events which occurred in Rhode Island for the reporting periods listed above. Monthly provisional totals should be analyzed with caution because the numbers may be small and subject to seasonal variation.

Public Health Briefings

Rhode Island Department of Health
Patricia A. Nolan, MD, MPH, Director

Edited by Judith Feldman, MD,
John P. Fulton, PhD, and Bela Matyas, MD

Screening for Non-Insulin-Dependent Diabetes: The Issues

John P. Fulton, PhD, and Joann M. Lindenmayer, DVM, MPH

Disease Burden

Non-insulin-dependent diabetes mellitus (NIDDM) is a disease of major import. NIDDM accounts for approximately 90% of all diabetes.[1] About 5% of adults over 40 years of age have been diagnosed with NIDDM, and an equal proportion are believed to have the disease, but not to have been diagnosed.[1] The prevalence of NIDDM is higher among Native Americans, Hispanic Americans, and African Americans than among non-Hispanic whites.[1] Diabetes mellitus (DM) causes 50,000 deaths in the US each year.[2] As a cause of death, DM ranks seventh behind heart disease, malignant neoplasms, cerebrovascular diseases, chronic obstructive pulmonary disease, unintentional injuries, and pneumonia and influenza.[2]

Early Intervention

Early identification and treatment of NIDDM has many benefits. Glycemic control reduces the risk of acute decompensation, and alleviates polyuria, polydipsia, fatigue, weight loss with polyphagia, blurred vision, and vaginitis or balanitis.[3] Regular check-ups allow early detection and medical intervention for diabetic retinopathy, nephropathy, neuropathy, hypertension, dyslipidemia, cardiovascular disease, and foot lesions.[3]

Screening

Standards for NIDDM screening are well established.[1] Nonetheless, case finding for NIDDM is practiced unaggressively; about half the prevalent cases are thought to be undiagnosed.[1] An estimated 35,000 cases of NIDDM may be undiagnosed in RI, for example.

Table 1.—Major risk factors for NIDDM

1. Family history of diabetes: parents or siblings with diabetes
2. Obesity: >20% over ideal body weight
3. Race: Native American, Hispanic American, African American
4. Age: >40 years plus any of the preceding factors
5. Previously identified impaired glucose tolerance (IGT)
6. Hypertension or hyperlipidemia: cholesterol ≥240 mg/dl; triglycerides ≥250 mg/dl
7. In women: History of gestational diabetes mellitus or delivery of babies >9 lbs

Screening for NIDDM may not have been pursued aggressively in the past because the rationale for screening NIDDM was not compelling. The known, moderate benefits of early NIDDM detection were offset by a number of factors: The advantages of glycemic control early in the course of the disease were unclear, asymptomatic patients resisted the substantial behavior changes necessary for achieving unproven benefits, and treatments for complications such as retinopathy were not well developed.

Recent Developments

A number of recent developments have strengthened the rationale for NIDDM screening. Most significantly, the Diabetes Control and Complications Trial (DCCT) demonstrated that tight glycemic control in persons with insulin-dependent diabetes mellitus (IDDM) "delays the onset and slows the progression of diabetic retinopathy, nephropathy, and neuropathy."[4] Since "the relationship between microvascular disease and hyperglycemia" is similar in IDDM and NIDDM, the American Diabetes Association (ADA) concluded that "it is reasonable to employ the same glycohemoglobin and blood glucose goals" in IDDM and NIDDM, "pending the outcomes of clinical trials that are studying the benefits of achieving such goals in NIDDM."[3] Also, treatments for diabetic complications have been improved; if used early in the disease process, they may reduce the risk of adverse outcomes such as myocardial infarction, amputation, blindness, and renal failure. Finally, two new screening tools, developed for use in tandem, may lower the cost of screening and improve its acceptability among persons eligible for screening. One is a short questionnaire to identify risks for NIDDM,[5] the other an enhanced random capillary blood glucose measurement.[6] In sum, the benefits of early NIDDM detection are now believed to be substantial, and new screening tools may facilitate case finding.

The ADA approved a position on screening for NIDDM in 1989, and revised it in 1993.[1] The ADA presents a strong rationale for NIDDM screening in asymptomatic adults, recommending a three-step approach: 1) Identify adults with ≥1 major risk factor for NIDDM (Table 1). 2) Perform a fasting plasma glucose test (no food or beverage other than water for at least 3 hours before testing) or a random plasma glucose test (any food or beverage other than water within 3 hours of testing) on all persons identified in Step 1. 3) Refer persons with fasting plasma glucose levels >115 mg/dl or with random plasma glucose levels >160 mg/dl to physicians for diagnostic testing.[1]

Remaining Issues

Important screening issues remain unresolved. First, the effect of tighter glycemic

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control on the onset and progression of diabetic retinopathy, nephropathy, and neuropathy in persons with NIDDM, although believed to be positive and potentially substantial, remains unknown. The DCCT Research Group warns: "If the main conclusions of this trial with regard to the benefits of reducing glycemia are extended to patients with NIDDM, careful regard for age, capabilities, and coexisting diseases will be necessary. We therefore advise caution in the use of therapies other than diet that are aimed at achieving euglycemia in patients with NIDDM."[4] Second, compliance with behavioral regimens for improving glycemic control in persons with NIDDM may still be problematic, despite the promise they hold for the prevention and delay of diabetic complications. Again, the DCCT Research Group warns: "Intensive therapy was successfully carried out in the present trial by an expert team of diabetologists, nurses, dieticians, and behavioral specialists, and the time, effort, and cost required were considerable. Because the resources needed are not widely available, new strategies are needed to adapt methods of intensive treatment for use in the general community at less cost and effort."[4] Third, the new screening tools described above have not been widely tested, and will require time for full evaluation and (if appropriate) widespread deployment. Fourth, the effectiveness of *mass screening* for NIDDM in preventing or delaying the onset of diabetic complications has not been tested. Unlike case finding, mass screening is not performed in the context of a provider-patient relationship; major barriers exist in the transition between mass screening and the long-term medical follow-up needed to control NIDDM. Mass screening should be piloted to address these barriers.

The Rhode Island Diabetes Control Program (the Program) has received a grant from the Centers for Disease Control and Prevention to study the use of new screening modalities for NIDDM (the risk questionnaire and the enhanced random capillary glucose measurment described above) in primary care practices serving high-risk urban populations. Over the course of a year, the Program will identify all active patients in the practice who are over age 20 and who have not been diagnosed with NIDDM or IDDM, and invite them to be screened. The following parameters of screening will be assessed: sensitivity, specificity, cost, acceptablity, and extent of follow-up. Particular attention will be focussed on identifying barriers to screening and follow-up. For further information on the study, please call the Diabetes Control Program, 401-277-3442.

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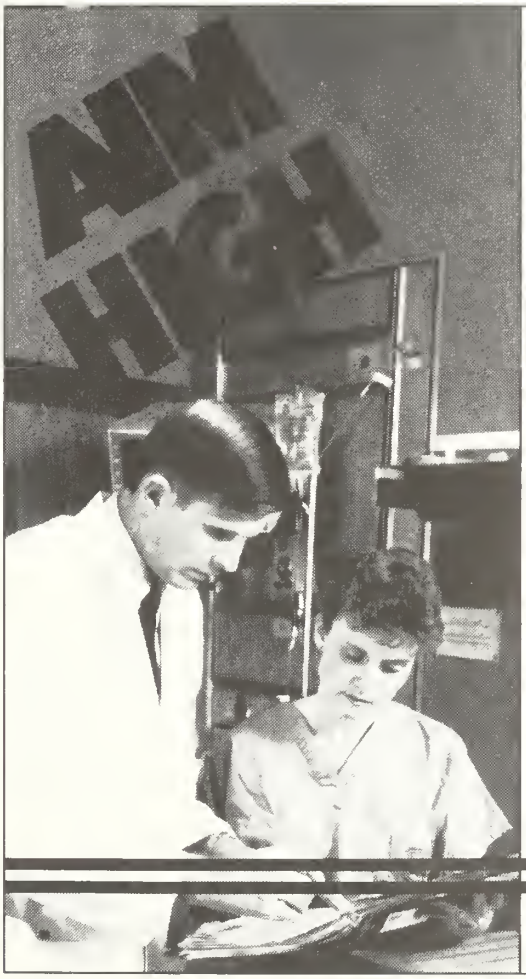

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THE RHODE ISLAND MEDICAL JOURNAL HERITAGE

90 Years Ago (October 1905)

Henry A. Jones, MD, resident physician for the Rhode Island State Institutions at Howard, writes a lengthy, sensitive essay discussing the lay treatment of the insane in Rhode Island during the prior century. He begins his commentary by declaring that "Those who think that all is being done that can be done for the betterment of the insane, have but to study the situation a little and listen to the appeals for help from those whose lives are spent in their welfare." The author reviews the attempts, often misguided and cruel, during the prior century to provide help to the mentally ill. Even Roger Williams, he points out, insisted that explicit facilities and resources be set aside for the mentally deranged fellow citizens. One of the greatest needs to be addressed, states Jones, is in the selection of supervisors of the insane asylums. "The day is fast passing away when expolicemen, jailers and politicians are appointed as superintendents of the mentally ill." He states: "Rightly or wrongly, during all this period it did not appear to the authorities that medical knowledge and skill were necessary in the one who filled this position." He contends that there is no reason why an insane person should not be treated as a sick person. "He should enter the hospital, not through the lay methods of deception and deceit, not with the thought constantly rankling in his mind that he has been deceived, not with the feeling that he is a prisoner, but with the comforting assurance that he has received as good treatment as the no less worthy accident case. When the insane are placed on this basis and treatment is followed along these lines, better results will be obtained, confidence will be restored and many a noble mind, darkened by melancholy's gloom will be cheered, and Rhode Island's motto 'Hope' will not be forever blotted out."

Charles S. Christie, MD discusses surgical methods in the general practice of obstetrics, observing that every puerperal woman is indeed a surgical patient. The article represents a very detailed, practical treatise on what equipment and expendable supplies should be carried by the physician and the obstetrical nurse in fulfilling the needs of the home-based obstetrical patient. Patients, for example, are asked to have prepared, in advance of their need, a lengthy list of articles including sterilized towels, soap, corrosive sublimate, safety pins, rubber sheeting, fountain syringes, pads - and a one-half pint of whiskey.

Albert Midgley, DMD, outlines the current treatment for maxillary bone fractures. "The results we look for in the treatment of any fracture," he says, "are complete reduction and adaption of the parts, a firm rapid union and finally restoration to normal function with no deformity of the part."

The minutes of the Providence Medical Association are printed. During the June 5, 1905, meeting it was voted unanimously to accept an invitation from Brown University's Biology Department that their meeting rooms at the college be made available to the Medical Association for its gatherings.

A report by Charles V. Chapin, MD, Superintendent of Health, indicates that the death rate in June and July represented an annual mortality rate of 17.02 per thousand. July deaths, his report states, is frequently high because of diarrheal diseases during hot weather.

50 Years Ago October 1945

The lead article, by Roland Hammond, MD, discusses the life and professional accomplishments of Hugh Owen Thomas. The author, a former president of the Rhode Island Medical Society, first considers the cherished tradition of bone-setting in Wales indicating that the Thomas family throughout the 18th century, successfully practiced bonesetting in the community of Anglesea, Wales. Evan Thomas then brought his unique skills to Liverpool retiring in 1863. One of his sons was Hugh Owen who attended a conventional medical school (Edinburgh) and was then launched upon a remarkable career in innovative orthopedic surgery. Innumerable operative procedures, instruments, orthopedic appliances and splints were devised by Thomas, including his world-famous Thomas leg splint used by every major army through World War II.

Louis Siebacki, MD discusses post-convalescent care in rheumatic fever patients .

A summary of hospital news includes the following: The enrollment of 136 student nurses in the local hospital schools of nursing; Butler Hospital is planning to open an outpatient clinic; Memorial Hospital intends to expand its inpatient facilities by 58 beds contingent upon the successful completion of the current fund drive; and Woonsocket Hospital is polling the population within its catchment region to determine the opinions and needs of this community.

The Council of the Rhode Island Medical Society recommends that the annual dues be elevated to $25 per year. Reports were also reviewed from Society committees exploring (1) the feasibility of establishing a statewide institute of pathology to serve all regional hospitals; (2) the Society efforts to provide post-war education for returning physician-veterans; and (3) the establishment of a Service Bureau for Society members.

25 Years Ago October 1970

The entire October, 1970, issue is devoted to papers, reminiscences and messages honoring Alex M. Burgess, Sr, MD for over fifty years of outstanding community service including his role as chief physician at the Miriam Hospital, the Charles V. Chapin Hospital and Rhode Island Hospital. The major paper was an address honoring Burgess given by William B. Castle, MD.

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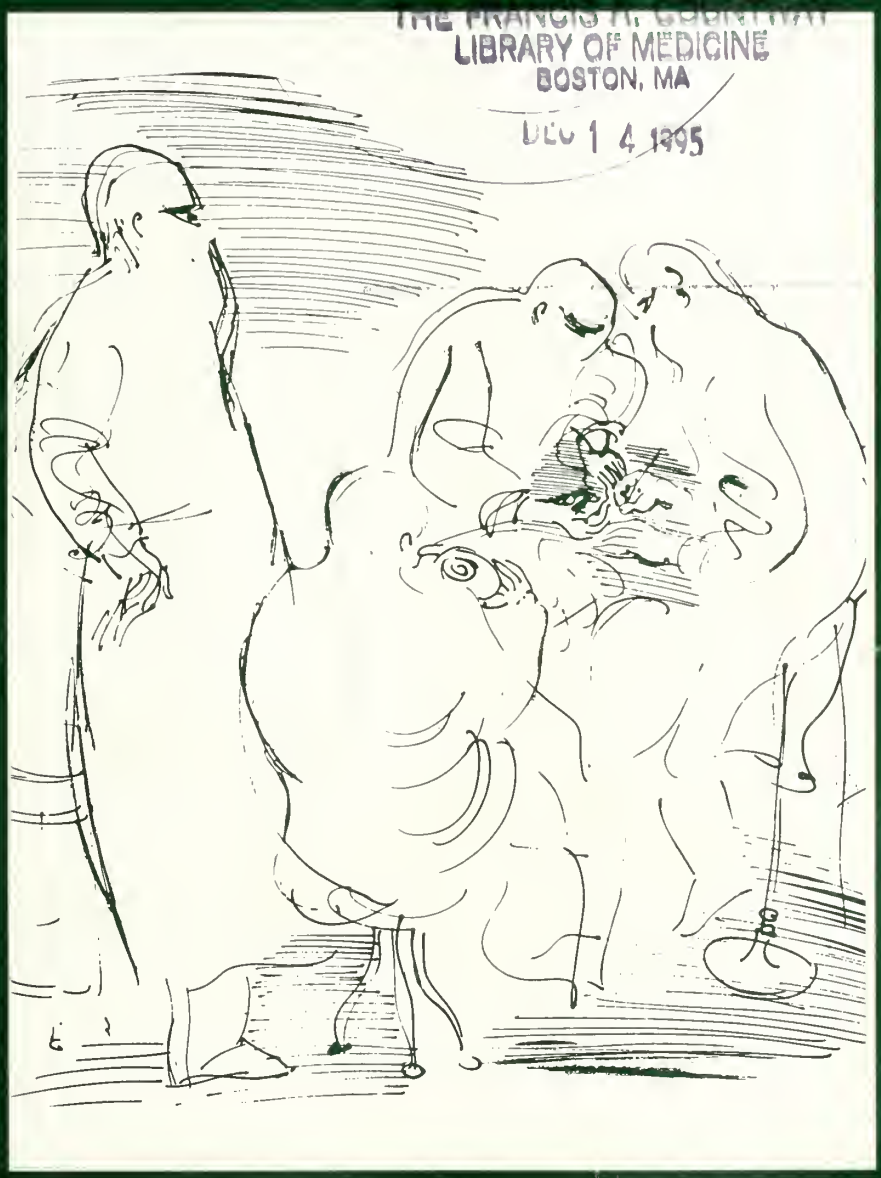

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Cover: Pen and ink sketch of an operating room scene by French impressionist Raoul Dufy.

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COMMENTARIES

William Budd and Typhoid Fever

A major concern of Western medicine during the early decades of the 19th century was the identity, classification and nature of the fevers. The dominant thought asserted that fever constituted not a mere symptom but rather an essential disease unto itself which may, in time, exhibit complications of the brain, lungs or other organs. No one at that time disputed the existence of subvarieties of fever—intermittent, hectic, continuous, quotidian, relapsing—but these differences in febrile presentation were ascribed to "different intensities of the same poison" producing such ultimate disorders as malaria, typhus, smallpox or typhoid.

The fever poison was never fully defined and its inferred existence was attributed to zymotic degeneration of biologic materials and miasmatic emanations, typically from swamps, marshes and sewage. Thus, in 1871, the British Registrar General confidently declared that "Abundant rain . . . purifies the atmosphere, and carries off zymotic exhalations which generate disease." This belief (that organic decomposition culminates in disease) was called the pythogenic (ie, born of putrescence) theory and, until the last decades of the 19th century, was widely advocated. Specifically, the proponents of pythogenesis believed that diseases such as cholera, typhus and typhoid " . . . may originate *de novo* out of the dirt and neglect which surround us."

An increasingly vocal minority of physicians advocated an alternative presumption: that different varieties of fever were reflections of entirely distinct species of disease each with its own pathognomonic changes within internal organs.

It was the genius of an English physician, William Budd, which finally clarified the dynamics of typhoid fever more than two decades before Eberth and Gaffky had isolated and cultured the causative organism of typhoid, now called *Salmonella typhi.* Beginning with his 1857 paper in *Lancet*, Budd amassed clinical data which incontestably supported the theory of a specific contagion. His overwhelming evidence was summarized in a memorable text published in 1873.

His conclusions:

> That typhoid fever is, in its essence, a contagious, or self-propagating fever, and is a member of the great natural family of contagious fevers, of which small-pox may be taken to be the type. That the living body of the infected man is the soil in which the specific poison, which is the cause of the fever, breeds and multiplies. That the reproduction of this poison in the infected body, and the disturbance attaching to it constitute the fever. That this reproduction is the same in kind as that of which we have, in small-pox, ocular demonstration. That the disease of the intestine, which is its distinctive anatomical mark, is the specific eruption of the fever, and bears the same pathological relation to it which the small-pox eruption bears to small-pox. That, the contagious matter by which the fever is propagated is cast off, chiefly, in the discharges from the diseased intestine. That as a necessary result, sewers and the cloacae which, under existing sanitary arrangement, are the common receptacles of these discharges are, also, the principal instruments in the transmission of the contagion; and consequently, that, in many instances, the infected sewer, and not the infected man, appears as if it were the primary source of the specific infection. That once cast off by the intestine this poison may communicate the fever to other persons in two principal ways—either by contaminating the drinking water, or by infecting the air. That, as an inevitable consequence of the impalpable minuteness of the contagious unit, and the many invisible and untraceable ways in which it is transmitted, cases must be constantly occurring, exactly as in the other contagious fevers, whose linear descent cannot be followed, and which spring up, therefore, under the semblance of spontaneous origin. And lastly, that by destroying the infective power of the intestinal discharges, by strong chemicals or otherwise, the spread of the fever may be entirely prevented, and that by repeating this process in every fresh case as it arises, the disease in time may be finally extinguished.

The 16 years after the 1880 discovery of the typhoid bacillus provided humankind with most of its tangible advances regarding this disease: culture of the organism (1884), isolation of paratyphoid organisms (1896), development of an effective vaccine (1896), and the diagnostic Widal blood test (1896). But the dramatic reduction in morbidity and mortality from typhoid, which can be documented to have begun in the 1870s, represents the epidemiological insights of the eloquent physician from Devon, William Budd.

Most of the *laboratory* advances in our understanding of the enteric fevers reflects the creative labors of numerous French and German medical scientists. It was, however, the uniquely Anglican concern with communal and personal hygiene (cleanliness is next to godliness) which empowered the field investigations of Snow (in cholera) and Budd (in typhoid) in the sewage systems of urban London and rural Tawton. And it was the kinetics of fecal-oral route infection, demonstrated by them, which translated directly to effective sanitarian control of these diseases first undertaken in England. Create a barrier between sewage and drinking water, said these scientists, and you will have eradicated these diseases. Their reasoning was virtually flawless, certainly with cholera; but with typhoid they failed to envision the possibility of an occasional immune carrier, ostensibly healthy, but in truth functioning as a mobile reservoir of typhoid. The epidemiological implications of this unusual mode of typhoid spread would not become apparent until the first decade of the 20th century.

Stanley M. Aronson, MD

The Civil Rights of Mary Mallon

No one disputes the events after August of 1906; the facts prior to this date, however, remain conjectural.

General William Henry Warren, a prominent New York City banker, rented a summer house for his family of three in Oyster Bay, Long Island. On July 1906 they moved in, bringing with them a complement of seven live-in servants. On August 27, one of the servants became acutely ill with typhoid fever; and by September 3, five more cases of typhoid had arisen within the household, including the General's wife and daughter. There were no further cases but the owner of the home, fearing that the value of her property was now in jeopardy, recruited an established epidemiologist and sanitarian, Dr George A. Soper, to seek out the origins of the contagion. Soper, schooled in the principles established by predecessors such as Budd, quickly eliminated the usual sources of enteric fever (faulty privies, deteriorating sewer systems, contaminated water supply) leaving him with the uneasy likelihood that a healthy human might be the carrier of the pathogen. By bacteriologic assays he eliminated from suspicion Mr Warren and six of the seven servants. The seventh, a Mary Mallon, had quietly resigned her job as the family cook shortly after the first case of typhoid had emerged and had then disappeared. She was described by her fellow house-servants as remote, unfriendly, at times violently hostile and "a rather dirty person."

Soper felt obliged to pursue his one remaining lead and he sought out a Mrs Sticker whose employment agency in Manhattan had originally recruited Mary Mallon as the family cook. Slowly and deliberately Soper reconstructed Mallon's employment history as family cook, going back many years. He then interviewed most of these families. Beginning in 1900 there had been a household in Mamaroneck, then several in Manhattan, then one in Maine, then Sands Point in Long Island, then Tuxedo Park, New York. In each instance, one or more individuals in the household had developed typhoid; and in each instance Mallon was said to have discretely departed to seek employment elsewhere. In the seven households investigated, Soper identified 53 cases of acute typhoid fever (with three deaths) all temporally associated with Mallon's employment as a cook. Soper readily admitted that these statistics were quite conservative since many of Mallon's known places of previous employment could no longer be investigated and not all of her tours of duty had been obtained through the Stricker employment agency. Furthermore, Soper counted only those primary cases of typhoid ascribable to direct contact with Mallon's food preparation while not considering the many secondary cases stemming from the momentum of the initial outbreaks. Years later, Soper fully acknowledged that the true number most likely exceeded 1,000.

Armed with circumstantial evidence of a compelling association between Mallon's cooking and multiple outbreaks of typhoid, Soper tracked her finally to a new site of employment, confronted her with the epidemiologic data and requested her voluntary cooperation in verifying her carrier state. Mallon's pathologic temper was amply demonstrated and Soper barely escaped her wrath. Undeterred however, he appealed to the New York Department of Health and eventually Mallon was arrested, but only after a violent struggle in which two policemen suffered injuries, one losing most of one ear. Mallon was kept in an isolation ward at Willard Parker Hospital where she exhibited no ill-health but repeated stool cultures, nevertheless, demonstrated an abundance of *S. typhi*. By order of the health authorities she was then remanded to a small bungalow next to Riverside Hospital, on North Brother Island in the East River. Her cottage was provided with all necessary amenities and she was free to roam the island and use its facilities, including the local chapel.

In 1908, G.F.O'Neill, a local attorney, took on her case as an instance of imprisonment without due process of law, without legal representation, indeed, without even a trial. The judge dismissed the request for release, pointing to a 1905 Supreme Court judgment regarding compulsory vaccination, which declared that prudent measures undertaken to protect the public were a legitimate exercise of the state's police powers. By this time Mary Mallon's story became widely publicized and the June 20, 1909 edition of William Randolph Hearst's *New York American* vividly elaborated on the morbid events, labelling her as ". . . the most dangerous woman in America." The newspaper also provided her with a new name: "Typhoid Mary."

In February 1910, after 35 months of isolation (during which time she repeatedly asserted her innocence claiming that her imprisonment was a British plot to supress her activities in behalf of Irish independence) Mallon was offered her freedom on two conditions: that she refrain from any employment requiring contact with food; and that she report to the Department of Health at 3–month intervals.

She was then released and promptly broke both promises, disappearing into the urban sprawl of municipal New York. For the next 5 years she held various cooking posts in numerous homes and restaurants, under a number of aliases, producing a further series of typhoid fever outbreaks.

In 1915 there was an unexplained cluster of 20 cases of typhoid among the patients at the Sloane Hospital for Women. Soper was called, and he immediately recognized the chef as Mary Mallon now under the assumed name of Brown. She was promptly remanded to the same East River cottage. Some 17 years later, on Christmas morning, 1932, Mallon suffered a severe stroke, remaining in a semicomatose state for another 6 years before dying on November 11, 1938.

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In what most regarded as undue haste, she was interred in a Bronx cemetery within hours of her death. No friend or relative attended her funeral.

These, then, are the accepted details in the tragic life of Mary Mallon.

The New York Department of Health has been accused of abridging Mallon's civil liberties, indeed, banishing her without trial to life imprisonment. Many claimed that a mere quirk of microbial happenstance, utterly beyond her control, had somehow converted her into an unwilling chronic carrier. The department, on the other hand, pointed to its many attempts to work out some sort of compromise with Mallon; it insisted nevertheless that it could never abdicate its obligation to protect the health of the larger community. It claimed that all society represents an uneasy equilibrium between private autonomy and the needs of the community and that no system of government can prevail for long without some visible authority in matters of health and social stability. (Plato describes an important trial in Athens and quotes the judges: "Tell us Socrates . . . do you suppose a city can exist and not be overthrown, in which the decisions of law are powerless, set aside and trampled upon by individuals?")

The debate regarding the civil liberties of the innocent carrier may have obscured yet another arena of contention. The arrival to these shores of some 36 million immigrants between 1880 and 1920 was greeted with varied emotions, particularly so since most newcomers were poor, under-educated and with a greater vulnerability to such infectious diseases as cholera, typhoid, tuberculosis and poliomyelitis. The waves of arriving Irish had, for example, coincided with major outbreaks of cholera and typhoid in east coast cities; and nativist hostilities to the new immigrants were translated readily to a blanket accusation that the Irish were the cause of these outbreaks, this leading to a demand for more stringent immigration barriers. These complaints ignored the fact that the Irish were the chief victims of these contagions which had been spread exclusively by contaminated water supplies. The spread of poliomyelitis, between 1910 and 1920, was similarly blamed upon immigrant Italians and Jews.

Newspaper reports invariably mentioned Mary Mallon's Irishness, as well as her alleged temper, suggesting that a Celtic heritage and a confronting personality were somehow the necessary preludes to the carrier state. Epidemiologists, on the other hand, concluded that at least 5% of those exposed to the typhoid bacillus became chronic carriers, meaning that there were at least 20,000 carriers of all ages and persuasions wandering the streets and country roads of the United States in 1906. Yet only Mary Mallon's name crops up as the evil exemplar of the carrier state.

In 1986 an isolated case of typhoid fever had been traced to a salad bar employee of a McDonald's restaurant in Maryland. Two features about the newsprint coverage of this minor outbreak deserve mention: First, that these reports repeatedly emphasized that the carrier was an immigrant woman, hinting that a lack of citizenship somehow facilitates the spread of infectious disease; and second, by naming the identified carrier as "Typhoid McMary," they effectively reminded the readership of the Celtic burden of typhoid guilt. The metaphor of the witch-like immigrant woman as the carrier of enteric disease continues.

Some further observations need to be offered: Without any help from carrier-immigrants, typhoid fever had continued to flourish throughout the United States including those heartland cities where few if any immigrants had ventured. Indeed, in the United States army of 1898-1900, with approximately 107,000 officers and men (most of whom were native-born), there were 20,738 cases of typhoid, with 1,580 deaths.

Even if all immigrants had somehow been excluded from this nation typhoid would nevertheless have continued to exert its toll until American society could instill better personal hygiene habits in its residents and until local communities were sufficiently motivated to establish water supplies free of fecal contamination.

Stanley M. Aronson, MD

Typhographical Errors

Biologists describe an evolutionary phenomenon called convergence whereby two or more genetically distinct species of life, in adapting to the same environmental stresses, outwardly begin to resemble each other; this congruence can be so marked as to suggest that they must have shared a common genetic ancestry. Words which sound much like each other, even sharing identically spelled roots, may also represent a form of linguistic convergence despite the fact that their etymologic origins are quite diverse.

In 1829, Pierre Louis proposed a formal name for what he considered to be a distinct variety of febrile enteric fever. Selecting stupor as the distinguishing feature of this disease, he suggested that it be called typhoid. The Greek root, *typhos*, signifies smoke or, metaphorically, confusion, stupor or delerium. The *-oid* suffix, also Greek, announces that this enteric fever somewhat resembles, but is not, the typhus diseases.

The older word, typhus, now confined to diseases caused by the Rickettsial organisms, had once served to identify a broader class of febrile disorders characterized by skin eruptions, prostration and stupor. The typhus fevers had included, amongst others, such vague entities as Camp Fever and Jail Fever. To the extent that any epidemiologic characterization had been possible before the advent of diagnostic microbiology, the typhus fevers seemed to attack selectively populations living in overly crowded, stressful conditions (prisons, barracks) particularly in winter months.

So, the terms typhus and typhoid had once been employed by physicians to describe states of febrile confusion, and until the latter decades of the 19th century, were thought to represent essentially the same toxic disease process. The nosological distinction between typhoid and typhus did not

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become received belief until Eberth's bacillus was generally accepted as the etiologic agent of the former in the 1880s. What, then, about words with similar roots such as typhlitis (the older term for appendicitis), *Typhaceae* (the family of marine grasses including the cattails), Typhon (the fabled Grecian monster with one hundred heads each breathing fire and said to live beneath Mount Etna), and even the meteorologic term, typhoon?

Each of these words (typhoid, typhus, typhlitis, Typhaceae, Typhon, typhoon) shares the root *typh-* suggesting a single, common Grecian ancestor. Yet in reality most of them descend from diverse linguistic origins. Typhlitis stems from a Greek root *typhlos* meaning blind (ie, defining the appendix as a blind-ending structure; and the science of blindness prevention is called typhlology). Typhaceae is derived from another Greek root, *typha*, meaning cattail; Typhon is a Greek word of undetermined origin which has now become a generic term for all giants especially evil ones. And typhoon represents two Cantonese words (*tai* and *fung*) which together describe violent cyclonic storms.

Living languages remain a fluid community of purposeful sounds; and, like living organisms, they respond to all sorts of Darwinian pressures, preserving only those words which can adapt to and fulfill current demands, while joyously welcoming mutant newcomers from all available sources. A living vocabulary, in truth, is the most unsentimental, yet the most meritocratic, of systems. In the evolution of language the choice is remorseless: a word becomes either a Dar-winner or a Dar-loser. No matter how proud its ancestry, an unused word will eventually be consigned to oblivion. Thus there is a constant, tumultuous flux, with words of improbable, bizarre origins coming and going. It is not terribly surprising, therefore, that some unintended convergence in spelling will be encountered.

Linguists also talk of an accretional process whereby new words (neologisms) can be created merely by appending appropriate letters or syllables as prefixes and suffixes. A word such as telangiectasis, for example, brings together *tel-* (Greek, meaning distant or terminal), *angeion* (Greek, meaning vessel), and *ekstasis* (Greek, meaning to dilate, expand or exhalt). Now collectively joined, the three elements define a new word in pathology describing a cluster of dilated, terminal blood vessels.

Yet there is a danger in too casual an interpretation of a word origin unless its genealogy is rigorously explored. All kinds of interpretive mistakes may arise if the analysis is superficial or careless. Furthermore, since there are only 26 letters to play around with, random permutations may lead to the strangest of sequences. By dissecting away the proximal and distal parts of a word reversing the process of accretion—it is possible to identify the core meaning of the intact word; it is also possible to end up with utter nonsense. Take, for example, the names of four of the regional hockey teams, all members of the National Hockey League: the *Boston Bruins*, the *New York Rangers*, the *New Jersey Devils* and the *New York Islanders*. If one were now to strike away the first and last letters of each of these team names, seeking some deeper semantic meaning within them, we end up with such aboriginal words as: bruins, rangers, devils, and islanders (ie, ruin, anger, evil and slander)—none even remotely cognate with the team names (which are, variously, of Germanic, Frankish, Latin and Old English origins). Those who believe that deep conspiracies underlie most things in life will readily suspect that these hidden words represent a secret plot to malign the good name of professional hockey. As further evidence of the focus of this conspiracy, they will point darkly to the fact that no other professional team (with the possible exception of the Pittsburgh Pirates) is burdened with a similar Trojan horse encapsulated within its hallowed team name. More objective observers who have witnessed the mayhem both in the stands and in the hockey rink may conclude, however, that these inner words, reached either by random happenstance or by seditious plot, are not far off in defining the character of the sport. Those burdened with typhus, typhoid or even typhoons, on the other hand, remain much too preoccupied to worry about secretly inserted words within words.

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Reassessing Cancer Mortality in Rhode Island, an Old Urban State

John P. Fulton, PhD

State of the art cancer therapy begins with universal, high quality primary health care, from which patients may develop an understanding of cancer prevention and receive appropriate cancer screening and referral, as necessary, for specialized cancer therapy.

The Rhode Island Department of Health analyzed cancer mortality rates for residents of Rhode Island and the US as a whole, 1950-1989, to observe trends and to identify causes of death that distinguish Rhode Island from its sister states.

Background

Previous research[1] had established that Rhode Island cancer mortality, among the highest in the US, displays an "urban profile."[2] In brief, Rhode Island, one of the most urban of states, has higher than average cancer mortality. When this differential is analyzed, it is found to be caused by cancers of very few sites, including cancers related to diet (eg, cancers of the stomach and colon-rectum), cancers in which diet is implicated (eg, cancers of the breast and prostate), and cancers related to tobacco use (eg, cancers of the lung, urinary bladder, esophagus (also related to alcohol use), oral cavity, pharynx, and larynx). The mortality rates from such cancers are elevated in urban areas throughout the developed world.[2]

Methods

US cancer mortality rates for 1950-1989 and Rhode Island cancer mortality rates for 1950-1979 were obtained from published statistics.[3,4] Rhode Island cancer mortality rates for 1980-1989 were derived from vital records and from US Census data. All rates, published and derived, are directly standardized for age, using the 1970 population of the US as the standard population, are specific for race, decade, and gender, and are expressed as "average annual deaths per 100,000 population per year."

Rates for African-Americans were not available for the years 1950-1979. African-American rates for individual cancer sites were not used because the Rhode Island rates, based on small numbers, are associated with large standard errors.

Results

The RI/US cancer mortality differential among whites has persisted from the 1950s through the 1980s, although it has diminished slightly (Table 1). The differential has been greater for males than females.

Table 1.—Death rates, whites, Rhode Island and the US, by gender, cancer site, and decade

	Males			Females		
Cancer Site/Decade	RI	US	RI/US	RI	US	RI/US
All Cancers						
1950-1959	208.0	176.6	1.18	157.8	141.6	1.11
1960-1969	224.5	190.0	1.18	145.1	132.4	1.10
1970-1979	236.9	204.1	1.16	144.9	131.7	1.10
1980-1989	240.5	212.2	1.13	149.8	137.1	1.09
Lung/Bronchus						
1950-1959	34.6	29.6	1.17	4.4	5.1	0.86
1960-1969	53.5	46.8	1.14	7.4	7.6	0.97
1970-1979	71.7	64.0	1.12	15.2	15.3	0.99
1980-1989	76.3	71.9	1.06	26.7	26.0	1.03
Except Lung/Bronchus						
1950-1959	173.4	147.0	1.18	153.4	136.5	1.12
1960-1969	171.0	143.2	1.19	137.7	124.8	1.10
1970-1979	165.2	140.1	1.18	129.7	116.4	1.11
1980-1989	164.2	140.3	1.17	123.1	111.1	1.11

Rates are average annual, age-standardized, using the 1970 US population as standard, expressed as deaths per 100,000 population.

Mortality trends in both geographical areas were similar during the period of observation (Table 1). White male mortality from all cancers combined increased monotonically, but each ten-year increase was less than the last. White female mortality from all cancers combined decreased from the 1950s to the 1960s, remained about the same in the 1970s as the 1960s, then increased from the 1970s to the 1980s. Cancers of the lung/bronchus ("lung") drove the trends in all-cancer mortality. The increase decelerated among white males, who were already experiencing substantial mortality from cancers of the lung in the 1950s, and accelerated among white females, who were experiencing little mortality from cancers of the lung in the 1950s. From 1950 to 1989, the RI/US differential in mortality from cancers of the lung decreased among white males, but increased among white females. Mortality from cancers, except lung, decreased steadily from the 1950s through the 1980s among white males and females in both geographical areas. Decreases were more dramatic among females than males. The RI/US differential in mortality from cancers except lung remained relatively stable.

In the 1970s the RI/US cancer mortality differential for white males was caused by cancers of eight sites (Table 2), including two strongly related to diet (colon/rectum and stomach), one for which diet is implicated (prostate), and five strongly related to

ABBREVIATION USED
ASSIST: American Stop Smoking Intervention Study

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Table 2.—Death rates, selected cancers, white males, 1970-1979 and 1980-1989, Rhode Island and the US

Cancer Site	1970-1979 RI	1970-1979 US	1970-1979 RI/US	1980-1989 RI	1980-1989 US	1980-1989 RI/US
Lung/bronchus	71.7	64.0	1.12	76.3	71.9	1.06
Colon/rectum	35.8	25.8	1.39	33.2	24.8	1.34
Prostate	21.7	20.3	1.07	22.9	21.9	1.05
Stomach	12.7	9.0	1.41	10.0	6.9	1.45
Urinary bladder	10.3	7.3	1.41	7.9	6.2	1.27
Brain/nervous system	6.4	5.2	1.23			
Esophagus	6.2	4.4	1.41	6.2	4.8	1.29
Oral cavity/pharynx	8.0	5.6	1.43	5.6	4.6	1.22
Melanomas of skin	5.3	3.1	1.71			
Larynx	3.9	2.7	1.44	4.0	2.4	1.67
All other	66.6	65.0	1.02	62.7	60.4	1.04

Rates are average annual, age-standardized, using the 1970 US population as standard, expressed as deaths per 100,000 population.

Table 3.—Death rates, selected cancers, white females, 1970-1979 and 1980-1989, Rhode Island and the US

Cancer Site	1970-1979 RI	1970-1979 US	1970-1979 RI/US	1980-1989 RI	1980-1989 US	1980-1989 RI/US
Breast	31.4	27.0	1.16	31.1	27.2	1.14
Colon/rectum	26.6	19.8	1.34	20.8	17.2	1.21
Stomach	5.6	4.3	1.30	4.3	3.1	1.39
All other	81.3	80.6	1.01	93.6	89.6	1.04

Rates are average annual, age-standardized, using the 1970 US population as standard, expressed as deaths per 100,000 population.

Table 4.—Death rates, all cancers, 1980-1989, Rhode Island and the US, by race

Race	Males RI	Males US	Males RI/US	Females RI	Females US	Females RI/US
African-Americans	333.1	306.3	1.09	202.2	161.2	1.25
Whites	240.5	212.2	1.13	149.8	137.1	1.09

Rates are average annual, age-standardized, using the 1970 US population as standard, expressed as deaths per 100,000 population.

the use of tobacco (lung/bronchus, urinary bladder, esophagus, oral cavity and pharynx, and larynx). In the 1980s the RI/US mortality differential for white males was caused by cancers of ten sites, including the eight 1970s' sites, plus cancer of the brain and melanomas of the skin. Differentials of no greater than 1/100,000 were observed for cancers of each other site in both decades.

The RI/US cancer mortality differential for white females was caused by cancers of the same three sites in the 1970s and the 1980s (Table 3), including two strongly related to diet (colon/rectum and stomach), and one for which diet is implicated (breast). Differentials of no greater than 1/100,000 were observed for cancers of each other site in both decades.

Among African-Americans of both genders, mortality in the 1980s from all cancers combined was higher in Rhode Island than the US (Table 4). In both areas, mortality was substantially higher among African-Americans than whites, regardless of gender.

Discussion

Rhode Island continued to exhibit an urban cancer profile in the 1980s. Cancers related to tobacco use and diet predominated among those with higher mortality in Rhode Island than the US as a whole. All differentials observed in the 1970s persisted into the 1980s. Small differentials for cancers of the brain/ nervous system and melanomas of the skin were observed for the first time in the 1980s, following well-documented increases in the incidence of both throughout the US from 1970 to 1989.[5]

Mortality from cancers, except lung, decreased steadily from the 1950s through the 1980s among white males and females in both the United States and Rhode Island.

The RI/US cancer mortality differential diminished steadily in the 40 years of observation. Differences in lifestyle formerly associated with geography of residence are disappearing in the US as a whole, with the urban lifestyle predominating.

The ravages of tobacco use are painfully evident in Rhode Island and the US as a whole. Lung cancer was responsible for the increase in cancer mortality among whites between the 1950s and 1980s. Mortality from other cancers combined actually decreased in the same period, largely because of improvements in therapy. Cancers related to tobacco use were also responsible for much of the RI/US cancer mortality differential among white males in the 1970s and the 1980s. Although the prevalence of cigarette use among Rhode Islanders was not measured until 1973, it is believed to have exceeded 50% among males in the 1950s and 1960s, high even by urban standards.

Colorectal cancer was an important cause of mortality and contributed substantially to the RI/US cancer mortality differential throughout the 40 years of observation. A strong ecological correlation between colorectal cancer mortality and diet is observable throughout the world. Nations in which complex carbohydrates contribute a large majority of calories to the diet have very low colorectal cancer mortality; nations in which complex carbohydrates are supplanted by fats have high colorectal mortality. Even though clinical trials have not been performed to test the efficacy of low fat diets in the prevention of colorectal cancer, the ecological relation between diet and colorectal cancer is so strong that the American Cancer Society and the National Cancer Institute both recommend modifications in the American diet to reduce the proportion of calories from fat.[6]

Cancer prevention efforts must focus on tobacco use and diet. Recognizing this, the health department has selected high priority year 2000 health objectives[7] related to tobacco use (Table 5), and has estabished and run Rhode Island Project ASSIST, a local version of the American Stop Smoking Intervention Study developed by the National Cancer Institute. The health department has also selected high priority year 2000 health objectives[7] related to diet (Table 5), and has established a "Five a Day for Better Health" program, guided by the National Cancer Institute and the US Centers for Disease Control and Prevention, which promotes increased dietary consumption of fruits and vegetables.

Other important cancer control efforts

include screening for cancers of the breast and cervix, and assuring state-of-the-art therapy for the victims of all cancers.[8] The health department has selected high priority year 2000 health objectives[7] for women's cancer screening (Table 5), and is continuing its efforts to assure high rates of screening among women throughout the state, with a special focus on women of low income. State of the art cancer therapy begins with universal, high quality, primary health care, from which patients may develop an understanding of cancer prevention and receive appropriate cancer screening and referral, as necessary, for specialized cancer therapy. In this vein, the health department has selected high priority year 2000 health objectives[7] for primary health care (Table 5), and has played an important role in expanding primary health care services to people of low income through the RIte Care program.

A strong ecological association between colorectal cancer mortality and diet is observable throughout the world.

It is time to revisit cancer control planning in Rhode Island. The plan which has served us well in the first half of this decade must be evaluated and modified in light of new surveillance information and developments in cancer control. Nonetheless, as the present analysis demonstrates, the major challenges haven't changed: tobacco use, diet, and access to screening and treatment. We must meet them with renewed purpose and vigor.

Table 5.—High priority year 2000[7] health objectives selected by the Rhode Island Department of Health to guide its cancer control efforts

Tobacco Use
- "Reduce cigarette smoking to a prevalence of no more than 15% among people aged 20 and older."
- "Reduce initiation of smoking by children and youth so that no more than 15% have become regular cigarette smokers by age 20."
- "Reduce smokeless tobacco use by males aged 12 to 24 to a prevalence of no more than 0.5%."
- "Enact and enforce comprehensive laws on clean indoor air that prohibit or strictly limit smoking in the workplace and enclosed public places."

Environmental Tobacco Smoke
- "Reduce by 50% the number of children exposed to environmental tobacco smoke in enclosed spaces."
- "Increase to 50% the number of workplaces that are smoke free."

Diet
- "Reduce dietary fat intake to 30% of calories or less and saturated fat intake to less than 10% of calories among 60% of people aged 2 and older."
- "Increase complex carbohydrates and fiber-containing foods in the diets of 60% of adults to 5 or more servings of vegetables (including legumes) and fruits, and to 6 or more daily servings for grain products."

Women's Cancer Screening
- "Increase to at least 90 percent the proportion of women aged 40 or older who have ever received a clinical breast examination and a mammogram, and to at least 80 percent those aged 50 or older who have received them within the preceding 1 to 2 years."
- "Increase to at least 95 percent the proportion of women aged 18 and older with uterine cervix who have ever received a Pap test, and to at least 95 percent those who received a Pap test within the preceding 1 to 3 years."

Primary Health Care
- "Increase to at least 95% the proportion of people who have a specific source of ongoing primary care for coordination of their preventive and episodic health care."
- "Improve financing and delivery of clinical preventive services so that virtually no Rhode Islander has a financial barrier to receiving, at a minimum, the screening, counseling, and immunization services recommended by the US Preventive Services Task Force."

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Review of Hodgkin's Disease and Lung Cancer Following Non-Hodgkin's Lymphoma in Rhode Island and Review of the Literature

Graca M. Dores, MD, Marilyn E. Miller, MD, Stanley Schwartz, MD, and Joshua O. Benditt, MD

The primary focus of this review is to identify the frequency of Hodgkin's disease (HD) and lung cancer in patients with a previous history of non-Hodgkin's lymphoma (NHL). In Rhode Island each major medical institution reports to a central State Registry, The Hospital Association of Rhode Island (HARI), which was established in 1984. All cases of NHL reported between 1984 and 1993 were identified. Patients reported to HARI who had HD and/or lung cancer following the diagnosis of NHL were studied. Those diagnosed with a second malignancy concurrently (<6 months) with the initial NHL, are listed but not included in the analysis. Individuals with a diagnosis of chronic lymphocytic leukemia, lymphoma cutis, or Kaposi's sarcoma are not included in this study.

Review of Cases in Rhode Island

In the Rhode Island State Cancer Registry there were 1,602 cases of NHL between January of 1984 and December of 1993. Of these cases, 214 were reported to have multiple cancers. Of these 214 patients, 61 had NHL followed by a second cancer. The most common second cancers, excluding NHL, were skin, lung, breast, colon, and prostate cancers (Table 1). Patients were considered to have a second NHL if the histology of the second NHL differed from the primary NHL. Cases of HD and lung cancer reported at MHRI were also reviewed. Two additional cases of HD and 5 cases of lung cancer following NHL were identified. Therefore, the information presented cannot be considered to be complete and represents only a partial number of reported cases.

Table 1.—Cases of Non-Hodgkin's Lymphoma in Rhode Island Followed by a Subsequent Cancer*

Second Primary Cancer Site	# Cases
Breast	5
Sarcoma	1
Stomach	1
Pancreas	1
Liver/Bile Duct	1
Colon	5
Rectum	3
Prostate	5
Bladder	2
Kidney	3
Larynx	2
Lung	6
Hematopoietic	2
Skin	9
Hodgkin's Disease	1
Other	2
Unknown	3
NHL	9
Total	61

*Data obtained from HARI (1984-1993, inclusive)

Two cases of HD preceded by a diagnosis of NHL were identified during this 10 year period (Table 2). The mean age at diagnosis of NHL was 60 years and the mean interval to development of subsequent HD was 12.5 years. Both individuals had low grade NHL which was treated with chemotherapy with or without radiation therapy. Both were females, had a smoking history and developed advanced stage HD. Patient #1 also developed squamous cell lung cancer at the site of previous radiation therapy. After the diagnosis of HD the survival of the patients was 6 and 17 months.

Both patients were treated for HD and required hospitalization for several weeks prior to their demise.

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There is no clear explanation why smokers with non-Hodgkin's lymphoma have a greater risk of developing lung cancer than smokers in the general population.

Lung Cancer Following NHL

Eleven cases of lung cancer were identified in individuals with a history of NHL (Table 3). The majority of individuals had intermediate grade lymphomas and the others had low grade NHL. Most cases were advanced stage NHL. The average age at diagnosis of NHL was 54.3 years (range 33-66 years), and 67% of patients were females. All patients were treated for NHL with chemotherapy and/or radiation therapy, except one case in which treatment was not specified. The average interval between the diagnosis of NHL and lung cancer was 8.8 years (range <1-15 years). Eight individuals were smokers and the ninth case was not specified. Most lung cancers (56%) were squamous cell carcinomas, 33% were adenocarcinoma and 11% were small cell carcinomas. Sites of previous irradiation were not necessarily related to the location of the lung cancer. Survival, with or without treatment of the lung cancer, was poor with the average survival being 6 months (range 1-15 months). Five out of 9 patients had no evidence of NHL at the time of their death.

Review of the Literature

Moertel and Hagedorn were the first investigators to report on the occurrence of second malignancy in patients with a history of leukemia or lymphoma.[1] In reviewing the world literature, they found 194 cases of second neoplasms. Forty nine of these individuals had lymphoma as the primary malignant disease. They did not specify the subtypes of the lymphomas nor the overall number of cases of leukemia and lymphoma reviewed. However, when they reviewed the cases at the Mayo clinic between 1944

ABBREVIATIONS USED
HARI: Hospital Association of Rhode Island
HD: Hodgkin's disease
NHL: non-Hodgkin's lymphoma

Table 2.—Cases of Non-Hodgkin's Lymphoma Followed by Hodgkin's Disease in Rhode Island

Pt.	Sex	Stage/NHL	Age at DX NHL	RX NHL	Stage/HD	Smoking	Yrs to 2nd CA	Status	Time 2nd CA To Death	Stage, Lung CA
1	F	IVB/Foll Sm Cleaved Cell	49	CT+XRT	IVB/Mixed Cell	Yes	15	Died–NHL+HD + Lung	6 mos.	IIIX Squamous
2	F	IA/Foll Sm/Lg Cell Cleaved	71	CT	IIIB/Nod Scl	Yes	10	Died–NHL+HD	17 mos.	
3	M	IIIX/Diffuse Lg Cell	33	CT	X/LP	X	Simultaneous	Alive+NHL + HD at 8 mos.		

CA = malignancy, CT = chemotherapy, DX = diagnosis, Foll = follicular, Lg = large, LP = lymphocyte predominant, Nod Scl = nodular sclerosis, Pt = patient, RX = treatment, Sm = small, WDLL = well-differentiated lymphoctic lymphoma, X = not specified, XRT = radiation therapy, "-" = without, "+" = with. Stage is expressed in Roman numerals.

and 1953, they found that amongst 2,340 patients with malignant lymphoma, 68 (2.9%) patients subsequently developed another cancer. Since that time many studies have assessed the risk of patients with NHL to develop a second primary cancer. The first case of lung cancer following NHL was described by Berg in 1967,[2] and the first case of HD developing after NHL was reported by Zarrabi in 1980.[3] To date 453 cases of lung cancer and 50 cases of HD have been described in individuals with a prior history of NHL.[1-17]

The risk of developing lung cancer in patients with NHL who smoke has been estimated to be greater than that of smokers in the general population.[6] The relative risk of patients with NHL developing lung cancer has been found to range between 1.36[15] and 1.57.[6] The mean latency period to develop a second primary malignancy ranges from months to more than 20 years. Several studies indicate that the latency period to develop lung cancer is short, ie, 5 years[4,5] while others describe the peak incidence of lung cancer to occur 4.5 to 10.0 years after diagnosis of NHL.[7,15] Among the reported cases of lung cancer, no specific histology is predominant. The vast majority of studies note that individuals with NHL who develop lung cancer are more likely to smoke.[6-10] Phadke and Manoharan described 2 cases of lung cancer developing in individuals with NHL who did not smoke.[11] Both of these patients had received prolonged therapy for lymphoma.

The most recent study to estimate the relative risk of HD found a 12-fold increased risk in patients with a prior history of NHL.[15] Among the cases of HD which develop after NHL, nodular sclerosis is the most frequent HD subtype reported. In the adult population >60 years old, nodular sclerosis HD represents only about 22% of primary cases of HD.[12] As opposed to the expected survival in the general population, Travis noted that in patients with NHL who developed subsequent HD, survival was short, with only 2 of 12 patients surviving 2 years or more.[12] This is in direct opposition to *de novo* HD where the 5-year survival in patients ≥60 years old is about 50%. Others reported that patients with HD following NHL were successfully treated with chemotherapy or radiation therapy with prolonged survival ranging up to 11 years.[16,17]

Several studies found that patients with NHL do not have an increased risk of developing a second malignancy,[1,3,4,13,14] yet others describe a significant increase in risk.[2,6,8,10,12,15] The latter studies include those with the largest numbers of cases of NHL. These studies found that the relative risk of second malignancy in patients with NHL ranges between 1.18 and 1.28.[2,8,15] Travis reported a relative risk of >4.0, and Lishner

Table 3.—Cases of Primary Non-Hodgkin's Lymphoma Followed by Lung Cancer in Rhode Island

Pt.	Sex	Stage/NHL	Age at DX NHL	RX NHL	Stage/Lung CA	Smoking	Yrs to 2nd CA	Status	Time 2nd CA To Death
1	F	IVB/Foll SM Cleaved Cell	49	CT + XRT	IIIX/Squamous	Yes	15	Died - NHL + Lung + HD	6 mos.
2	F	I_EX/Foll + Lymphoblastic (IIIX/Foll, PDLL)	52 (66)	XRT	IIIB/Adeno	Yes	14	Died + NHL + Lung	3 mos.
3	M	IIIAIWDLL	33	XRT + CT	IV/Squamous	Yes	15	Died - NHL + Lung	11 mos.
4	M	IEA/PD Large Cell	44	XRT + CT	"REG" Adeno	Yes	5.5	Died - NHL + Lung	2 mos.
5	M	IVA/Foll, WDLL	58	XRT+CT	IIIA/Squamous	Yes	13	Died+NHL+Lung	1 mo.
6	F	IIIX/Diffuse SLL	66	CT	IV/Squamous	Yes	<1	Died - NHL + Lung	2 mos.
7	F	IVA/Diffuse Intermed. DLL	63	X	IV/Adeno	Yes	<1	Died + NHL + Lung	1 mo.
8	F	IEX/Diffuse SM/LG	61	SURG + XRT	IIIBISCLC	Yes	3	Died + NHL + Lung	15 mos.
9	F	IVA/Diffuse LG	63	CT	IIIA/Squamous	X	3.5	Died - NHL - Lung	13 mos.
10	F	X	68	X	IIIB/Adeno	X	Simultaneous	Died + NHL + Lung	2 mos.
11	M	IVX/Diffuse SLL	53	X	IIIB/Squamous	X	Simultaneous	Alive + NHL + Lung at 8 mos.	

DLL = differentiated lymphocytic lymphoma, E = extranodal, Foll = follicular, Intermed. = intermediate, LG = large, PD = poorly differentiated, PDLL = poorly differentiated lymphocytic lymphoma, "REG" = regional, SCLC = small cell lung cancer, SLL = small lymphocytic lymphoma, SM = small, SURG = surgery, WDLL = well differentiated lymphocytic lymphoma, x = not specified. Stage is expressed in roman numerals.

found a cumulative risk of second cancer to be 11% at 15 years.[6,14]

Travis found that 1 out of 5 patients who survived 2 years after diagnosis of NHL would be expected to develop a new malignancy between 2 and 20 years following the initial diagnosis of NHL.[15] This is higher than the 13.4% incidence reported in Rhode island, albeit a much smaller study population. It is noted that the early peak incidence (5-9 years) of developing radiation-induced lung cancer in the Travis studies as well as that of Greene, is not consistent with the usual 10-year latency period required for solid tumors to develop after radiation therapy.[6,8,15] Usually this incidence begins to increase about 10 years after exposure to radiation and occurs predominantly in smokers. The risk of developing a second malignancy in NHL appears to increase[14] or persist over time.[15] This is in contrast to the risk of acute nonlymphocytic leukemia that returns to baseline after 15 years.[15] Lishner found the risk of second malignancy to be related to increasing age.[14] Berg reported the highest risk to be in middle-aged adults and that the risk decreased after age 60 to approach the risk of the general population.[2] Lishner[14] did not note any apparent association between therapy for NHL and subsequent cancer, although others have long noted such an association.[18]

Discussion

Several cases of lung cancer in patients previously treated for NHL have been described. Patients with NHL, who smoke and have received previous radiation therapy +/- chemotherapy for NHL are probably at greatest risk of developing lung cancer. Several studies found that the majority of patients who developed lung cancer were smokers.[6,7,9,10,12] Given the potential for increased risk of secondary malignancy in patients with NHL, especially those who receive chemotherapy and/or radiation therapy, they should be encouraged to abstain from smoking. There is no clear explanation why smokers with NHL have a greater risk of developing lung cancer than smokers in the general population. Patients with NHL have altered immunity, which has also been well described in patients with HD.[19] In addition, radiation therapy and/or chemotherapy and smoking may have a synergistic or promoter carcinogenic effect which may be further exacerbated by an underlying immunodeficiency.

There are several reasons why patients with NHL can develop second tumors. This may be due to a genetic susceptibility, exposure to carcinogens, endogenous predisposition or an underlying defect of the immune system. Both chemotherapy with or without radiation therapy can be immunosuppressive and/or mutagenic. Multiple risk factors for developing cancer may be present. These may include environmental pollutants, tobacco, infectious agents (ie, viruses), dietary factors, or socioeconomic factors. Alternatively, the development of second neoplasms may simply be a random occurrence.

There is no apparent association between the histology of the lymphoma and the development of subsequent lung cancer. Patients with all subtypes of NHL described in the above studies developed lung cancer with latent periods ranging between 3 years and 14 years. Lung cancers occurring within the first 6 months of diagnosis of NHL are unlikely to be related to the NHL or its therapy, given the short latent period.

The development of second cancers in patients exposed to radiation, as well as those treated for HD have been extensively studied.[18,20] This may in large part be due to the prolonged disease-free intervals or cures achieved with chemotherapy/radiation therapy. Now that patients with NHL are achieving a similarly prolonged survival, there should also be increased vigilance for development of second malignancies. The high frequency of HD noted in cases of previous NHL, should make the clinician aware that a new clinical presentation in a patient with NHL may be due to a different disease and not always due to recurrence of NHL. The poor survival noted after treatment of second or third malignancies, especially in older patients, should make the physician strongly consider the risks of therapy and quality of life issues in these patients.

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Chemotherapy Given for Lung Cancer Causes Incidental and Long-term Cure Of Fungal Skin Infection

A. Sattar Memon, MD, FACP

"Doc, I don't know what this stuff is doing to my cancer, but my athlete's foot infection is completely gone!"

Case Report

A 70-year-old World War II veteran was seen in 1991 for possible chemotherapy for locally advanced anaplastic cell lung cancer. From 1940 to 1942 he had served in the Pacific Theater of Operations where he had contracted a fungal infection starting with interdigital areas of his feet and eventually spreading to his loins, wrists and webs of his fingers. Several prescription medications, as well as over-the-counter antifungals, failed to create any lasting response. According to the patient, at least two dermatologists had told him that he was suffering from intractable fungal infection caused by *Tinea*, seen on scrapings. The patient does not recall being treated by currently available antifungal preparations such as the imidazoles.

Pertinent past history included cholecystectomy, appendectomy and recent open thoracotomy and right middle lobectomy for an anaplastic lung cancer found to involve the entire middle lobe.

Personal history revealed he had functioned as a salesman for the last four decades and had been regularly smoking two packs of cigarettes a day. Post-operative course and family history were unremarkable. Physically, there was no apparent abnormality except leathery, lichenified skin on his ankles, wrists and interdigital spaces.

Having received two cycles, 3 weeks apart of infusional chemotherapy with cisplatin and vepesid (VP-16), he was asked how he felt. In response, he stated: "Doc, I don't know what this stuff is doing to my cancer, but my athlete's foot infection is completely gone! I can't believe this! For the first time in the last 40 years I'm able to sleep through the night without having to get up to scratch the hell out of my body!" The patient continued to comment upon the complete disappearance of fungal infection from affected areas after the third and fourth cycle of chemotherapy. The patient did not receive any other anticancer therapy and certainly no topical or systemic antifungal treatment.

Since then the patient has been fully evaluated every 3 to 6 months. Since the initiation of his chemotherapy in the spring of 1991 until now, the fall of 1994, this patient has had no recurrence of fungal infection nor are there any signs of cancer-recurrence.

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Discussion

The majority of fungal skin infections are caused by *Trichophyton rubrum* (82%), *Trichophyton mentagrophytes* (14%) and *Epidermophyton floccosum* (4%).

The majority of fungal skin infections are caused by Trichophyton rubrum (82%), Trichophyton mentagrophytes (14%) and Epidermophyton floccosum (4%).

Most patients do not adhere to the prolonged regimen of topical antifungal agents needed for optimal therapeutic response. Early relief of the itching may foster a false sense of cure in the patient and, until recently, all available antifungal preparations have been myostatic and not mycocidal. The reason for this patient's dermatologic response to chemotherapy includes the following possibilities: The patient's immune system was not normal before developing a malignancy and this may have permitted and/or perpetuated fungal infection and its continued intractability to various antifungal therapies. Perhaps full immunoreactivity was restored by treatment of the cancer. The chemotherapy received by the patient may also have been fungicidal. It is ironic that the immune compromise associated with systemic chemotherapy in patients with malignancy can cause systemic fungal infections.

Following chemotherapy this patient has not had recurrence of his cancer after more than 3 years and has had an apparent cure of a widespread mycosis. Could this therapy be tried for other patients with fungal disease? It would be costly and toxic to infuse two to four cycles of chemotherapy to cure even the most intractable and widespread mycoses. Also, newer topical medications are now being used to treat *tinea* infections quite successfully. However, therapy with chemotherapeutic agents either in oral form or topical form or by modified intravenous infusion could conceivably be tested on appropriate patients. It is not clear if one or both drugs were needed to provide the antifungal effect on this patient. Vepesid (VP-16) is already available in oral form, but Cisplatin is not.

Conclusion:

On the basis of an apparent cure by Cisplatin and/or VP-16 of widespread and long-standing fungal infection, I suggest that focused clinical trials be used to assess the efficacy of these medications (perhaps in oral or topical form) in selected patients with intractable, chronic mycoses.

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Lumbar Spinal Stenosis: A Review

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Lumbar spinal stenosis can usually be identified after a thorough history and physical examination. Most individuals with this condition are successfully treated by nonoperative means.

Degenerative spinal stenosis is defined as an abnormal narrowing of the vertebral canal caused by osteoarthrosis. In the lumbar spine, this pathologic lesion can result in a spectrum of clinical syndromes when the dural sac and caudal nerve roots are compressed. The following review is intended to familiarize those who care for the elderly with this common geriatric condition.

Anatomic Considerations

A clear concept of lumbar spine anatomy is critical for an understanding the pathogenesis of spinal stenosis. There are two important anatomic regions to consider: the central canal and the nerve root canal (or lateral recess) (Figure 1). The *central canal* contains the dural sac. It is bordered anteriorly by the articulated vertebral bodies and dorsally by the laminae, ligamentum flavum and the inferior articular processes.[8] The *nerve root canal* begins where the nerve root sheath comes off the dural sac and ends at the intervertebral foramen. This lateral recess is bordered anteriorly by the vertebral body and disc, laterally by the pedicle and posteriorly by the superior articular facet.[1,5]

Osteoarthrosis affecting each lumbar motion segment (ie, 1 disc and 2 facet joints) can result in several clinical problems: In central stenosis, lateral stenosis and degenerative spondylolisthesis.[4] In *central stenosis*, a bulging anulus together with vertebral body osteophytes narrow the central canal from the front. Osteophytic enlargement of the inferior articular process along with reactive thickening of the lamina and ligamentum flavum compress the dural sac from behind (Figure 2). In *lateral stenosis* the nerve root canal is compromised. Early pathologic changes in this condition include narrowing of the posterior half of the disc space leading to forward rotation of the superior facet. Later, osteophyte formation on the medial edge of the superior articular process will further compress the nerve root

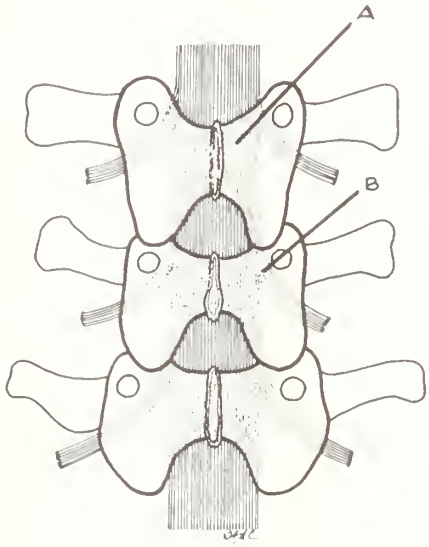

Fig 1.—Anatomic regions of the lumbar spine. A, central canal; B, nerve root canal.

in the lateral recess (Figure 3). Both central and lateral stenosis can affect multiple intervertebral levels. Lastly, in *degenerative spondylolisthesis* there is disc space narrowing and loss of facet joint articular cartilage allowing the upper vertebrae to slip forward on the lower. The central canal and lateral recess are narrowed as the inferior articular process of the upper vertebrae slides toward the back of the lower vertebral body (Figure 4).[4]

The pathophysiology of lumbar degenerative disease demonstrates where and how the nerve roots of the cauda equina become entrapped. It does not, however, explain how such mechanical compression causes the typical neurologic symptoms of spinal stenosis. Although controversial, the most plausible theories regarding the mechanism of nerve dysfunction include: altered cerebrospinal fluid flow, vascular ischemia and inflammatory changes affecting the roots.[10] The end result of these processes is nutritional compromise of the neural tissue. When the metabolic demands of the nerve root are not met, impaired impulse conduction occurs. The resultant sensorimotor dysfunction is manifested as pain, paresthesias and weakness.

Clinical Diagnosis

Symptoms usually develop between the fifth and seventh decades. A history of chronic low back discomfort with a more recent onset of radiating pain, paresthesias and weakness affecting the lower extremities is typical.[9] The symptoms are provoked by standing/walking and relieved by sitting or leaning forward.

The complaints of lower limb pain can be categorized into two general patterns.[2,11] In *neurogenic claudication*, both limbs are usually involved. Pain tends to radiate from the lumbar region/buttock down to the thigh and leg but does not affect a specific dermatomal distribution. This pain pattern is caused by central stenosis. In *typical sciatica*, pain is more often unilateral and tends to follow a specific dermatome. This symptomatology is generally due to lateral stenosis.

Physical examination at rest will often only show limited lumbar extension. Sensorimotor function is likely to be normal, and straight leg raising does not usually elicit pain. Testing of reflexes (which are often suppressed in the elderly) is unreliable. The pathophysiology of spinal stenosis is such that exercise may induce objective neurologic findings. Repeat examination after having the patient walk or climb stairs for several minutes may reveal a stooped posture due to flattening of the lumbar lordosis. Since L4-L5 is the most common intervertebral level affected, mild weakness in the great toe extensor or ankle dorsiflexors along with diminished sensation in the L4/L5 dermatomes may be present. Prolonged lumbar extension can also provoke the typical symptoms and signs.[2,9]

Differential Diagnosis

The two conditions most commonly confused with lumbar spinal stenosis are vascular insufficiency and peripheral neuropathy. The patient with *peripheral vascular*

ABBREVIATIONS USED
AP: Antero-posterior
CT: Computerized tomography
NSAID: Nonsteroidal anti-inflammatory drug

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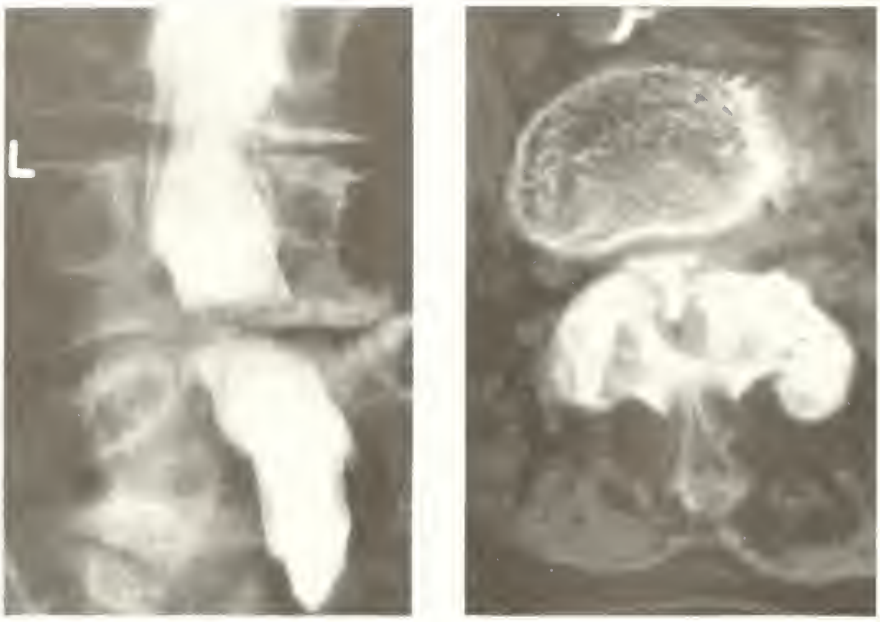

Fig 2.—Central stenosis at the L4-L5 intervertebral level. Left, lumbar myelogram (AP view); right, CT scan.

disease generally complains of cramping calf pain which progresses proximally in the limb. Symptoms occur after walking a constant distance and are relieved by standing. Walking uphill will shorten the claudication distance due to an increased muscular oxygen demand; walking downhill is better tolerated since less muscular effort is required. Physical examination will demonstrate absent pedal pulses and relatively normal lumbar motion.[2]

In contrast to vascular claudication, the extremity symptoms of neurogenic claudication tend to progress in a proximal-to-distal direction. The tolerated walking distance is variable and symptoms are relieved by sitting or leaning forward. Walking downhill is more problematic due to an increase in lumbar lordosis as the patient leans back to maintain balance. Physical examination will usually reveal palpable pulses and limited lumbar extension.

Peripheral neuropathy is also common in the elderly population. This condition, often associated with diabetes, is characterized by burning discomfort and paresthesias located below the knees in a stocking distribution. Symptoms are not activity related and tend to be worse at night.[2]

Radiologic Evaluation

Radiologic imaging in spinal stenosis serves to confirm the clinical diagnosis and defines the anatomic site(s) of neural compression. Plain *radiographs* of the lumbar vertebrae often suggest stenosis but cannot precisely determine its true extent. Non-specific findings consistent with lumbar spondylosis include: loss of disc space height, hypertrophic facets and thickened laminae. Plain films are also used to identify degenerative spondylolisthesis/scoliosis indicating coexistent segmental instability.

Myelography is the standard method of screening the subarachnoid space for compression and is most useful in demonstrating central stenosis. *CT scan* (post-myelogram) is an excellent method of depicting entrapment in both the central canal and the lateral recess. Typical findings in central stenosis include: enlargement of the inferior facet, hypertrophy of the ligamantum flavum, thickening of the lamina, generalized disc bulging and osteophytic ridges on the vertebral end plates (Figure 2b). This pathologic anatomy is also responsible for the extradural defects noted on AP and lateral myelographic views (Figures 2a and 4). The primary finding in lateral stenosis is specific narrowing of the nerve root canal by hypertrophy of the superior articular process (Figure 3).

Magnetic resonance imaging, though not yet the "gold standard," has the potential to become the primary imaging modality for spinal stenosis. This non-invasive study can survey the entire lumbar spine for dural sac impingement and is able to define precisely the pathologic anatomy of both central and lateral stenosis.[6]

Conservative Treatment

Patients with symptomatic spinal stenosis deserve a trial of conservative therapy. The one major exception to this generalization is the patient who presents with rapidly progressive neurologic dysfunction (ie, cauda equina syndrome). This condition is characterized by loss of sphincter control, saddle anesthesia, radicular leg pain and lower extremity weakness/paralysis. Cauda equina syndrome represents a surgical emergency requiring immediate operative decompression of the lumbar spinal canal.

Nonoperative treatment modalities include: controlled physical activity, anti-inflammatory medication, bracing, an isometric exercise program and epidural steroid injection(s). These conservative measures work either by reducing nerve root inflammation or by altering the posture of the lumbar spine.

For an acute exacerbation of spinal stenosis, short-term bedrest (usually fewer than 3 days) is often beneficial. Patients should lay supine or on their side with the hips and knees gently flexed. Sitting up in bed and prone positioning are to be avoided. Useful medications include nonsteroidal anti-inflammatory drugs (NSAID), analgesics and, on occasion, muscle relaxants and antidepressants. Due to their analgesic and anti-inflammatory effects, NSAID are the mainstay of pharmacologic treatment. Analgesics such as codeine are often necessary to control symptoms during the early phases of treatment. More potent narcotics should be used sparingly in the outpatient setting.[7]

Fig 3.—CT scan demonstrating lateral stenosis at the L5 level.

Fig 4.—Lateral myelographic view of degenerative L4-L5 spondylolisthesis.

When reasonable symptomatic relief has been achieved, the patient should then be gradually mobilized. A temporary brace, such as a flexible corset, is often helpful to the patient in regaining functional mobility. While the acute symptoms continue to abate, a program of isometric lumbar flexion exercises should be initiated. This regimen is designed to strengthen the muscular support of the lumbar spine (ie, the abdominal and paraspinal muscles). As the patient regains strength and becomes more active, the brace is gradually weaned.[7]

Most patients respond to this nonoperative regimen and will return to a reasonably normal lifestyle. For those individuals with persistent symptomatology after 4 to 6 weeks of conservative management, an epidural steroid injection should be considered. The potent anti-inflammatory effect of the steroid, though not curative, can reduce nerve root inflammation and will often palliate the symptoms of spinal stenosis.

Surgical Considerations

When symptoms fail to resolve after prolonged conservative treatment and interfere with the patient's quality of life, operative intervention should be considered. The intent of surgery is to alleviate leg pain and the symptoms of neurogenic claudication; improvement of lower extremity motor function is also a surgical goal. General indications for operation in patients with radiologically proven lumbar spinal stenosis consist of:

- leg pain/neuroclaudication that persists or recurs despite a 3 to 6 month trial of nonoperative management, and
- lower extremity pain associated with a functionally significant neurologic deficit.[3]

Once surgery is recommended, there are two major considerations. The surgeon must determine the extent of lumbar decompression required and the necessity for spinal arthrodesis (ie, fusion). The determination of which intervertebral levels to decompress is based on the preoperative clinical and radiologic evaluation. In general, all motion segments responsible for symptoms along with adjacent levels of radiographically significant stenosis should be decompressed. Lumbar fusion should be considered in the presence of degenerative spondylolisthesis/scoliosis and when low back pain comprises a major part of the patient's symptomatology. Arthrodesis may also become necessary if a radical decompression is performed.

Since most cases actually involve a combination of central and lateral stenosis, special attention must be paid at the time of surgery to both the central canal and the lateral recess. At each involved level, the lamina is removed out to the medial limit of the facet joints. After this decompression of the dural sac, each nerve root canal is checked for stenosis by passing a blunt probe out of the vertebral foramen. If root impingement is present, it is usually due to the superior articular process. In this situation, a medial facetectomy should be performed.

Summary

Lumbar spinal stenosis can usually be identified after a thorough history and physical examination. Most individuals with this condition are successfully treated by nonoperative means. Invasive radiologic studies and surgery are reserved for those patients who fail to respond to conservative measures. In these select cases, predictably good results can be expected from lumbar decompression.

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AIDS in Older Patients: A Problem of Increasing Concern

Wendy M. Stein, MD and Mark Fagan, MD

AIDS has been cited as the new "greater imitator" in the elderly, often manifesting as dementia and misdiagnosed as Alzheimer's disease or going completely undiagnosed until very late in the illness.

Older patients, a population once thought not to be at risk for HIV infection, are now recognized as warranting the same concern as younger populations for HIV screening. Those older than 50 years represented about 10% of the CDC AIDS population reported through 1992; of these, 30% are cases in persons older than 60 years.[9] The proportion of cases in this age group rose from 1% of the total AIDS population in 1981 to 3% in 1989.[5,13]

Increased number and age of asymptomatic carriers may increase the risk for HIV infection in older gay men. This may offset any projected decrease in new HIV infections anticipated with improved protection of the blood supply. Also, while the proportion of AIDS cases in persons over 60 years of age has been stable for the past several years at about 3%, the number of persons with AIDS is increasing, and thus the number of elderly with the disease is increasing as well.[13] HIV in those over 60 is likely underreported because the symptom complex is not correctly identified, or if transfusion related, the patients may not survive long enough to develop symptoms. Often when the syndrome is diagnosed, the diagnosis is delayed after extensive evaluations for malignancy or dementia. In a study by Ferro and Salit, 36% of older patients presented with AIDS-defining illnesses at the time of diagnosis.[7] The proportion of AIDS diagnoses made in the last month of life rises from 16% in those 50–59 to 37% in those over 80 years of age.[18] The financial and human costs are substantial.

Although elderly gay men report fewer partners and a decrease in the number of sexual encounters, homosexual activity continues to be a major risk factor through the seventh decade.[13] In a recent study by Gordon and Thompson, 38% of individuals over 60 years of age acquired HIV through sexual activity, the majority of which was homosexual or bisexual activity; 16% acquired the virus through IVDA and 9% through transfusions.[9] The number of cases of AIDS from transfusion is higher in children and young adults but transfusion-related cases make up a higher percentage in the elderly.[21] The proportion of cases associated with transfusion as the only risk factor increases from 1% in the young to as high as 60% when looking at those older than 70.[13]

Changes in Lymphocyte Function with Aging

Lymphopenia *is not* one of the many changes now known to be associated with the aging process; lymphopenia warrants investigation especially if the CD4:CD8 ratio is decreased.[3] Normal values for CD4 and CD8 levels in older patients are not well defined.[17] Many findings vary by study and often the defined study population, ie, who is elderly, differs substantially.

Evidence now suggests that changes in T cell function in aging may reflect functional alterations, as opposed to depletion of a particular cell type.[17] Defects in the ability of T cells to produce or respond to T cell growth factor such as IL-2 may be a cause of immune deficiency with aging.

Age-related Changes and the Course of HIV Infection

Declines in the activity of lymphocyte cell types as well as immune deficits secondary to related disease may exacerbate the effects of HIV and increase the frequency of opportunistic infections. There is a lower mean incubation time (to symptom onset) among elderly HIV+ patients (5.8 years) compared with younger adults (7.3 years).[15] And those over age 40 progress more quickly to end-stage disease and subsequent death after developing an AIDS defining opportunistic infection.[12] Sadly, this is further compounded by the fact that the proportion of AIDS patients having the disease diagnosed the same month they die is much higher than that of younger groups.[13]

Usually CD8 cells suppress HIV replication in autologous CD4 cells, occurring without destruction of CD4 cells. This loss of suppression activity may allow HIV replication at a faster rate in older patients.[12] Tumor necrosis factor alpha has been demonstrated to activate latent HIV *in vivo* and TNF alpha has been shown to increase with advancing age.[12]

Alterations in nonspecific or mechanical local defense factors may alter the pattern or frequency of infection. With the thinning of the vaginal wall secondary to estrogen loss seen in postmenopausal women, coitus may more often lead to mucosal tears.[15] Older patients also would not be using condoms for contraception leading to increased likelihood of transmission.

Response to opportunistic infection is different in this population; infections may recur more easily or result in co-infection more frequently. Antiretroviral therapies were tested, and side-effect profiles were developed in younger populations. These medications are often less well tolerated in older individuals who are more likely to be on multiple medications for concomitant diseases. Additionally, TB, bacterial pneumonia, and influenza occur more often in the elderly, with increased morbidity.

Presentations of HIV Disease in Older Persons

AIDS has been cited as the new "great imitator" in the elderly; often manifesting

ABBREVIATIONS USED

AIDS: Acquired immune deficiency syndrome
CDC: Centers for Disease Control
HIV: Human immunodeficiency virus
IVDA: Intravenous drug abuser
SDAT: Senile dementia, Alzheimer's type
STD: Sexually transmitted disease
TB: Tuberculosis
TNF: Tumor necrosis factor

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Table 1.—AIDS in Older Persons: A Case Series

Patient	Age	Sex	Ethnicity	Transmission Source
1	61	M	W	Prostitute
2	61	F	B	HIV+ Boyfriend
3	70	F	B	Unknown
4	64	M	W	Transfusion
5	70	M	W	Transfusion
6	60	M	W	Homosexual encounter
7	65	M	H	Unknown
8	69	F	B	Unknown

as dementia and misdiagnosed as SDAT or going completely undiagnosed until very late in the course of the illness.[3,4] AIDS dementia, however, may present more often with signs of a subcortical dementia as well as other neurological involvement such as myelopathy or peripheral neuropathy not seen in SDAT.[8] Ataxia, leg weakness, nonspecific tremors, paraparesis, reflex alterations, positive Babinski sign, urinary incontinence or other neurological findings are not common in early SDAT.[16] Additionally, irritable euphoric apathy or frontal lobe dysfunction do not appear in SDAT until memory disorder, constructional spatial difficulty and nominal aphasia are established. Aphasia of any sort is not commonly seen in AIDS dementia.[16]

HIV encephalopathy is more common in older patients whereas Kaposi's sarcoma is more common in younger patients.[7] AIDS symptoms (eg, weight loss) may be mistaken for occult malignancy prompting an extensive and potentially invasive diagnostic evaluation. Opportunistic infections may be treated as "just another pneumonia" or "anemia of chronic disease" associated with one the many chronic illness with which many older individuals are sometimes afflicted.

AIDS in Older Patients in Rhode Island

In an effort to better define the scope of the problem in Rhode Island, a list of all patients older than 60 years of age, admitted to Rhode Island Hospital, a 719-bed general hospital, from January 1, 1989 to December 31, 1993, and found to have HIV or AIDS listed in their hospital discharge summaries was compiled. Eight individuals were so identified. Characteristics of these individuals are listed in Tables 1 and 2.

Three individuals (37.5%) acquired the virus through sexual contact, two (25%) through blood transfusion and three (37.5%) had no source identified in the clinical record. One individual was diagnosed within two years of death, and one within one year of death; one individual was diagnosed within one month of death. Mean CD4 count at diagnosis was 184 for the six individuals with CD4 counts listed in the charts.

Conclusions and Recommendations

Older persons appear to be a population of increasing concern in terms of HIV screening and symptom recognition. Feldman found that at risk adults over the age of 50 were one-sixth as likely as a younger but otherwise comparable group to use a condom during sex, and one-fifth as likely to have been tested for HIV, perhaps related to the persistent myth that older persons are disengaged from sexual matters.[6]

Those who care for older patients need to do a complete sexual history and offer sexual education where indicated just as they would in the case of younger individuals. HIV screening and counseling should be considered particularly in the case of those individuals with a history of STDs or who report behaviors that put them at risk for HIV infection.[9]

Catania et al suggested that more population-based HIV seroprevalence studies need to be conducted.[5] More information needs to be learned of older persons' sexual and IVDA behavior, and what the risks are for older persons' having been infected via transfusion. And finally, we need to know more about the effects of antiretroviral therapy in older persons, what older persons believe about HIV and AIDS, and how to encourage them to seek early testing in order to achieve prompt detection of opportunistic infections. These recommendations can lead to earlier identification and treatment of HIV in older persons.

Table 2.—AIDS in Older Persons: A Case Series

Patient	Symptoms at Presentation	CD4 Count
1	Thrush, Weight Loss, Infiltrate, Weakness	147
2	Weight Loss	697
3	Anorexia, Weight Loss, Diffuse Infiltrates	3
4	Lethargy, Fatigue	130
5	Fevers, Weight Loss, Diarrhea, Diaphoresis	—
6	(Surveillance Testing)	—
7	Cough, Fevers, Diarrhea	24
8	Infiltrate	14

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Point of View: Therapy with Growth Hormone

Lyman A. Page, MD and Jay M. Orson, MD

With the advent of recombinant growth hormone, supply limits were lifted and attempts were made to define in the widest possible way a population that could benefit from growth hormone therapy.

Human Growth Hormone (HGH)—even in its crude form, isolated from human pituitaries—has been a wonderful treatment for individuals with pituitary dwarfism, the Tom Thumbs of the world. When human pituitary glands constituted the only source of the hormone, when its distribution was voluntarily but strictly controlled by the National Pituitary Agency in an effort to maximize the usefulness of a rare commodity, we knew exactly what growth hormone deficiency was. Affected children were pudgy, delicate, and soft, Dresden doll-like midgets with a tendency to hypoglycemia and hyperlipidemia. They had bone ages retarded sufficiently to produce decent, predicted ultimate heights, which, like hypothyroid children, they would never achieve without replacement of the missing hormone. And they responded to growth hormone at an optimal dose, arrived at by carefully constructed dose-response curves, of 0.08–1.0 units/kg body weight intramuscularly—or, later, subcutaneously—3 times a week. At roughly 2 units/mg this dose corresponds to about 0.12–0.15 mg/kg weekly.

We also knew about pituitary giants, whose existence, though rare, made it clear that enough extra growth hormone would make one grow beyond his apparent genetic destination as judged by the statures of parents and other family members. This effect on stature was far greater than the secular increase in height seen in successive generations with improved nutrition and living conditions and freedom from disease, such as has occurred over the last few centuries in the Western world (try to get into a medieval knight's armor!), and as shown in second-generation Japanese-Americans and American Hispanics. But, unlike these beneficiaries of improved living conditions, pituitary giants are not healthy. They die young (in their 30s) of infections, cardiovascular, and other problems if their metabolic abnormality is not corrected. They represent eloquent testimony that the use of HGH for non-growth-hormone-deficient short stature is not without risk.

With the advent of recombinant growth hormone, supply limits were lifted and attempts were made to define in the widest possible way a population that could benefit from growth hormone therapy. The definition of abnormality in the response to a patient's growth hormone levels to provocative stimuli was raised from 7 mcg/dl to 10, so that patients formerly classified as normal were now called deficient. As more testing occurred, it became clear that even in the best of hands, testing was unreliable. Patients previously and unequivocally diagnosed as growth hormone deficient (GHD) had, on retesting, normal responses of HGH. Patients who were truly deficient might have normal responses. Attempts to use multiple blood sampling to define abnormal *patterns* of HGH secretion as an explanation for these ambiguities "neurosecretory dysfunction"), yielded equally inconsistent results. Most pediatric endocrinologists came to feel that testing provided no clear means of deciding who was growth hormone deficient and who wasn't. This is probably because in most instances GHD is defined not by whether or not a patient *can* make HGH but by whether or not he *does*, and when.

Treating 3% of the population for short stature carries implicit assumptions that the treatment is safe and that the condition is a handicap, neither of which have been proven.

The expansion of the definition of HGH deficiency and pressure to treat short children has led, we think, to a treated population getting higher doses than before. The current "standard" dose is 0.35 mg/kg weekly, which, as noted above, is over 2 times the dose considered "optimal" in earlier times. Children on treatment excrete in their urines twice as much HGH as normal untreated children.

In a world yearning for normalcy, numerical parameters have a normal range defined by two standard deviations on either side of the mean. No one tries to change patients' cholesterols or blood pressures that are below the 3d percentile, or males (or, with basketball, females) with heights above the 97th. Treating of the population for short stature carries implicit assumptions that the treatment required is safe and that the condition is a handicap, neither of which have been proven. It also implies that we will continue treating 3% of the population forever, as the 3d percentile becomes taller.

We think that the indications for HGH treatment should be *deficiency*, except for ongoing clinical studies and the well-documented experience with Turner syndrome. (There are also patients with a variety of conditions destined to be disablingly short, who merit compassionate trials with HGH, even with supraphysiologic doses.) As a metabolic status GHD can usually be strongly suspected clinically. The shortest but fastest child in the class, who is thin for his height is not, in our opinion, likely to be GH deficient. In situations unclear after careful clinical appraisal, a litmus test of therapeutic trial at a dose of HGH of 0.12-0.15 mg/kg body weight/week and careful assessment of the growth response is legitimate. Response to higher doses cannot at this time be taken as evidence for GHD, and such doses cannot be assumed to be safe. As with other hormones, there may ultimately be indications for high-dose HGH therapy, but short stature in a normal child is not one of them.

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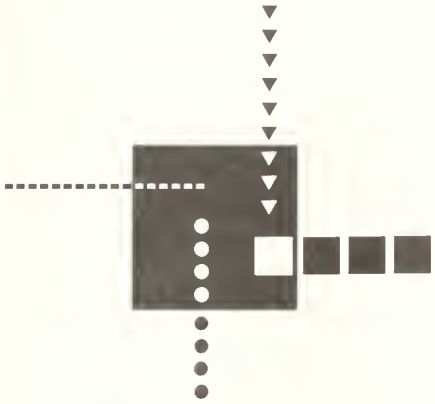
ABBREVIATIONS USED
GHD: Growth hormone deficient
HGH: Human growth hormone

Organized Medical Staff Section

Twenty Sixth Assembly Meeting
November 30–December 4, 1995
Washington Hilton and Towers Hotel
Washington, DC



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Send an AMA member physician representative from your hospital or health care delivery system to the 1995 Interim American Medical Association Organized Medical Staff Section (AMA-OMSS) Assembly Meeting to be held November 30 - December 4, 1995 in Washington, DC. Don't pass up this opportunity to participate in AMA's policy-making process and make a difference in the way your representative organization responds to managed care and other important issues facing today's physician. You can also gain valuable knowledge and make useful contacts by attending OMSS educational programs and networking functions.

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- The attributes of a successful self-governing physician organization (PO);
- The components of governance and resources needed to develop a community-based PO;
- What criteria should be utilized in making partnering decisions; and
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HEALTH BY NUMBERS

Rhode Island
Department of Health
Patricia A. Nolan, MD, MPH
Director of Health

Edited by Jay S. Buechner, PhD
Chief, Office of Health Statistics

Prostate Cancer in Rhode Island

In anticipation of renewed cancer control planning in Rhode Island, the Rhode Island Department of Health assessed data on prostate cancer in Rhode Island, New England, and the United States, and data on the use of prostatectomies in Rhode Island.

Methods

Incidence and mortality rates were extracted from publications of the National Cancer Institute and the North American Association of Central Cancer Registries.[1,2] New England incidence rates were constructed from incidence data available from Connecticut, Maine, Massachusetts, New Hampshire, and Rhode Island. Incidence data were not available from Vermont.[2] Rhode Island mortality rates were constructed from state vital records, using Census data for 1980 and 1990. All rates were age-standardized to the 1970 population of the United States. Previous analysis suggested under-reporting of newly diagnosed prostate cancers in Rhode Island.[3] Despite an estimated completeness rate of 95% for cancer case reporting overall, it is possible that Rhode Island and New England prostate cancer incidence rates, as presented for 1988-1991, may be under-reported by as much as 10 or 20%. Rhode Island prostate cancer incidence data for blacks, based on few cases, are associated with large standard errors and should be interpreted with due caution. Rhode Island prostate cancer mortality data for blacks, based on even fewer cases, are associated with such high standard errors that they are not reported here. Rhode Island data on prostatectomies performed in hospital inpatient settings during the twelve months ending September 30, 1994, and associated with a diagnosis of prostate cancer were derived from the hospital discharge data set managed by the Department, containing information on all discharges from acute-care general hospitals in the state.

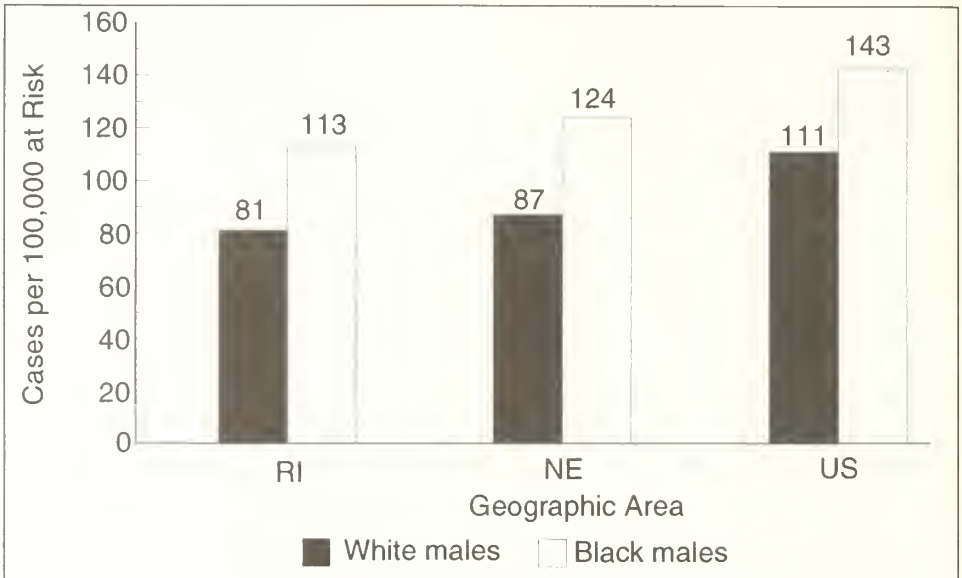

Fig 1.—Age-standardized prostate cancer incidence, 1988-1991, by race, for Rhode Island, New England, and the United States

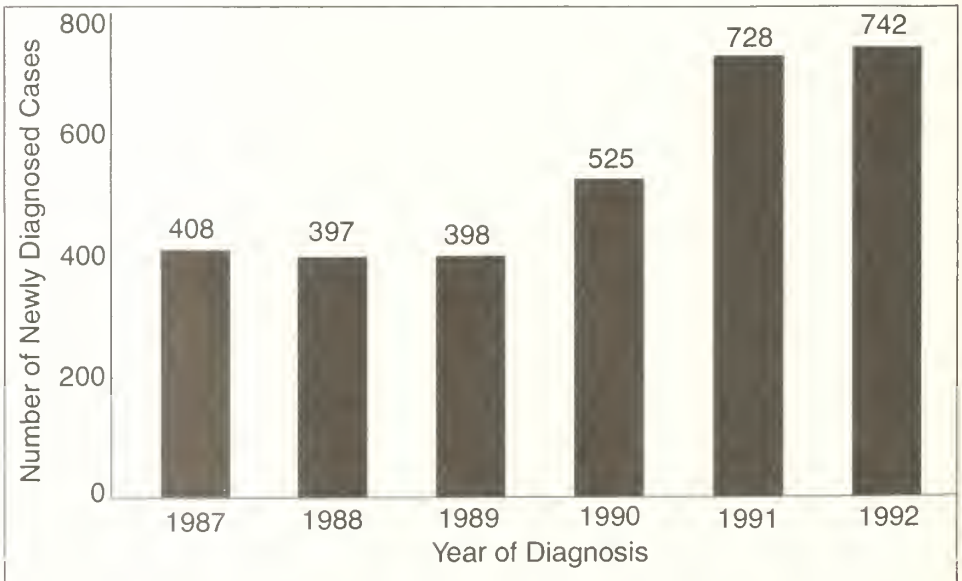

Fig 2—Newly reported cases of prostate cancer, 1987-1992, by year, Rhode Island

Submitted by John P. Fulton, PhD, Division of Preventive Health Services, and Jay S. Buechner, PhD, Office of Health Statistics. Health by Numbers *is edited by Jay S. Buechner, PhD, and William J. Waters, Jr., PhD.*

Observations

Prostate cancer incidence is substantially higher for black males than white males in Rhode Island, New England, and the United States, 40%, 43%, and 29% higher, respectively (Figure 1). That the incidence of prostate cancer for males of either race is lower in Rhode Island and in New England than the nation as whole may be an artifact of under-reporting in the former areas.[3]

Since the introduction of the serum prostatic specific antigen (PSA) test in the late 1980's, the number of newly diagnosed cases of prostate cancer reported to the Rhode Island Cancer Registry has increased dramatically (Figure 2). This increase has been noted throughout the United States and is attributed to improved case finding.[4]

Mortality from prostate cancer has remained stable in the recent past (Figure 3). Mortality in the 1980's was only slightly higher than mortality in the 1970's for both Rhode Island and the United States as a whole.

Prostate cancer mortality tends to be higher in more urban areas than in less urban areas. Rhode Island, historically one of the most urbanized of the 50 states, experiences a typically urban cancer profile, of which elevated prostate cancer mortality is an element. Rhode Island's prostate cancer mortality has been higher than the national experience for some time (Figure 3).[5]

During the 12 months ending September 30, 1994, 318 prostatectomies were performed in Rhode Island that were associated with a discharge diagnosis of prostate cancer (Figure 4). Most were transurethral (55%) or radical (42%). Eight retropubic prostatectomies, three local incisions, and one "other" prostatectomy were also performed. Many of the transurethral prostatectomies may have been performed for obstruction or hypertrophy of the prostate, resulting in a subsequent diagnosis of prostate cancer on the basis of pathology.

Discussion

In 1989 the Rhode Island Cancer Control Committee published a statewide cancer control plan for Rhode Island[6] which will be reviewed and updated, as necessary, in the near future. Cancer control strategies for prostate cancer were discussed extensively by the Committee in its preparation of the plan. It was clear then, as it is now, that we do not have sufficient knowledge to prevent prostate cancer, leaving early detection and treatment as the only possible control strategies. It was also clear then, as it is now, that a recommendation for *population-based* screening for prostate cancer can not be made, absent the results of carefully designed clinical trials. As discussed in the accompanying *Public Health Briefing*, results of clinical trials for prostate cancer screening are still a decade away. So many developments in the detection and treatment of prostate cancer have occurred since 1989, however, that any revision of Rhode Island's statewide cancer control plan will of necessity treat this subject in detail, with special emphasis on case finding during the preventive medical exam.

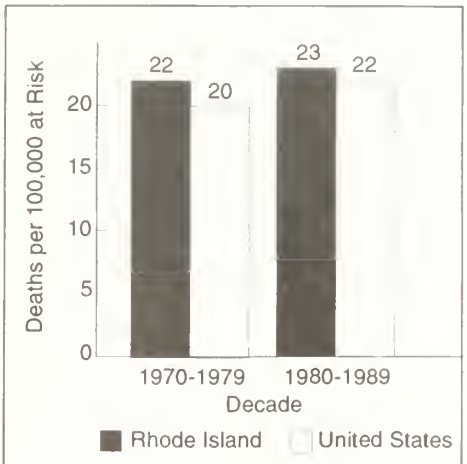

Fig 3.—Age-standardized prostate cancer mortality, 1970-1979 and 1980-1989, Rhode Island and the United States

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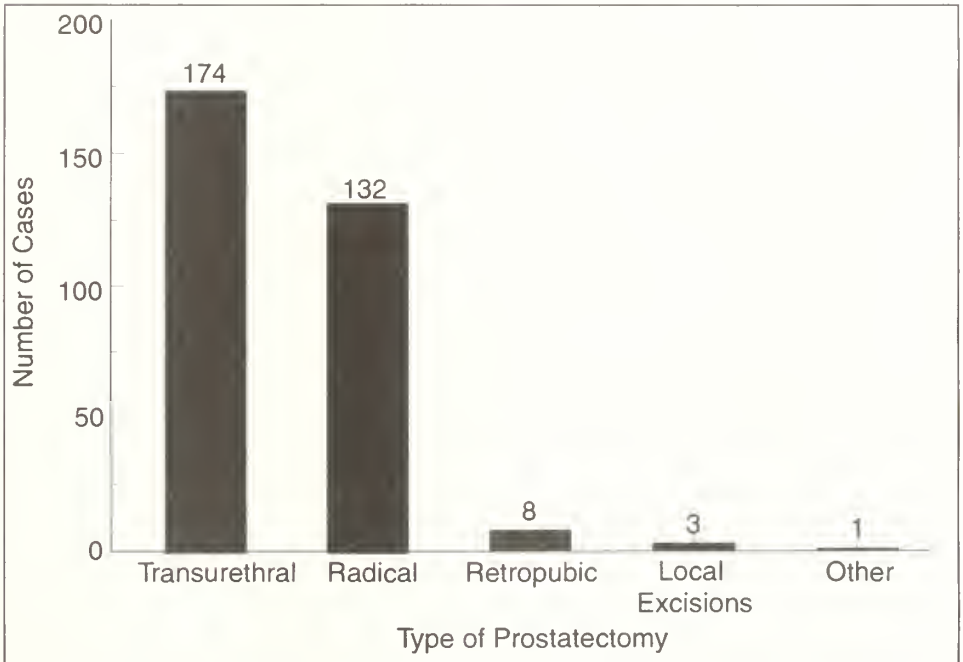

Fig 4.—Prostatectomies performed in 1994 and associated with a hospital discharge diagnosis of prostate cancer, by type of prostatectomy, Rhode Island

Public Health Briefings

Rhode Island Department of Health
Patricia A. Nolan, MD, MPH, Director

Edited by Judith Feldman, MD,
John P. Fulton, PhD, and Bela Matyas, MD

Update: Prostate Cancer Screening

John P. Fulton, PhD, and Joann M. Lindenmayer, DVM, MPH

The burden of prostate cancer in the U.S. is significant and appears to be increasing. Although prostate cancer is most likely to strike elders, men in their 40s and 50s may also be afflicted. Control of prostate cancer focuses on early detection, the subject of recommendations for case finding from the American Cancer Society (ACS), the National Cancer Institute (NCI), and the American Urological Association. However, clinical trials to determine the effectiveness of screening and treatment have not yet been completed, leaving key management issues unresolved for the next decade.

Rising Incidence

Prostate cancer is common in the U.S. In 1994, an estimated 200,000 cases were diagnosed, up from an estimated 165,000 in the previous year.[1] Although most cases are diagnosed among white males, the age-standardized incidence of prostate cancer is higher among blacks than whites: 209.6/100,000 vs. 159.2/100,000 in 1991.[2] In comparison, the age-standardized incidence of breast cancer in the U.S. in 1991, was 95.1/100,000 and 113.6/100,000 for black and white females, respectively.[2]

The incidence of prostate cancer has risen steadily in the U.S. since 1973, when it was first measured by the NCI's Surveillance, Epidemiology, and End Results (SEER) program. Between 1973 and 1991, the incidence of prostate cancer among males of all races in the U.S. rose from 64.1/100,000 to 163.1/100,000. A full half of that increase occurred since 1989, when the incidence of prostate cancer for males of all races was determined to be 111.5/100,000.[2] The increase in incidence which occurred through 1986 is attributed largely to the identification of prostate cancer on pathology following transurethral resections of the prostate (TURPs) for obstruction or hypertrophy of the prostate.[3] The sharp increase in prostate cancer incidence which occurred since 1986 is attributed largely to improved case finding "with the aid of digital rectal exam, transrectal ultrasound-guided needle biopsy, computed tomography, bone scan, and serum testing for prostate-specific antigen PSA."[4]

Significant Mortality

Prostate cancer causes substantial mortality in the U.S., accounting for an estimated 38,000 deaths in 1994.[5] In tandem with incidence, the prostate cancer mortality rate is highest among men ages 65 and over, although it is not trivial among men ages 55-59 (14.1/100,000 in 1987-91) and 60-64 (37.7/100,000 in 1987-91).[2]

In sharp contrast to the rise in prostate cancer incidence in the U.S. since 1973, prostate cancer mortality has increased only slightly, from 21.7/100,000 among males of all races in 1973 to 26.8/100,000 among males of all races in 1991.[2] That mortality remained flat during an unprecedented increase in incidence supports the position that improved case finding contributed substantially to the latter.

Control Strategy

Too little is known of the causes of prostate cancer to prevent its occurrence. Thus the control of prostate cancer has focussed on early detection and treatment, with the goal of preventing metastasis. However, a number of unresolved issues complicate management decisions.

Unresolved Issues

ISSUE 1: The early detection of prostate cancer has not been shown to reduce prostate cancer mortality in carefully controlled clinical trials.

In 1986, when the NCI published its *Cancer Control Objectives for the Nationa: 1985–2000*, it classified screening for cancer of the prostate with the digital rectal examination under "Category 3: Screening Impact Uncertain," observing that "No randomized clinical trial with mortality as an end point has been conducted so that precise calculations of the impact of the examination [digital rectal examination, or DRE] on cancer mortality are not possible."[6] Such data are still about 10 years away,[7] preventing the adoption of population-based screening for prostate cancer at present. Nonetheless, in the same 1986 document the NCI asserted "The use of the digital rectal exam-

ABBREVIATIONS USED

ACS: American Cancer Society
DRE: Digital rectal examination
NCI: National Cancer Institute
PSA: Prostate specific antigen
SEER: Surveillance, Epidemiology and End Results Program
TURP: Transurethral resection of prostate

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ination, however, is considered an essential part of good patient management. The early diagnosis of rectal and prostate cancers, in part through the appropriate use of rectal examinations in persons at high risk of one or both of the cancers, notably those over 50 years of age, could improve the outcomes for these patients."[6] In short, absent the results of clinical trials in 1986, the NCI could not recommend mass screening with the DRE for prostate cancer, but advocated case finding with the DRE as an essential part of "good patient management." The most recent ACS recommendation (below) is consistent with the NCI rationale, promoting case finding, not mass screening, with the DRE and the serum PSA test. The addition of the serum PSA test fits the rationale, as it has been shown to improve case finding when used with the DRE.[7]

ISSUE 2: It has been suggested that the application of current case finding recommendations may substantially increase the identification of clinically insignificant tumors (small, indolent tumors unlikely to metastasize and cause mortality), thus substantially increasing treatment-related costs (dollars and iatrogenic morbidity) without reducing mortality.

In a review of the recent literature, however, Slawin et al argue that this is not the case: "Clear evidence exists that these two manifestations of prostate cancer [clinically significant and insignificant] can be distinguished by differences in established prognostic features, such as the volume, grade, and extent of tumor. Application of these criteria to the cancers detected by DRE, PSA, and TRUS [transrectal ultrasound] has clearly demonstrated that an overwhelming majority of cancers detected today are clinically significant tumors and are not part of the larger group of latent tumors present, which remain largely undetectable by these modalities. . . . Widespread experience from various institutions consistently demonstrates that perhaps up to 10 to 15% of prostate cancers detected in PSA-based screening programs may be clinically insignificant, but that most tumors detected demonstrate features similar to prostate cancers detected by palpation. . . . In three large screening trials for prostate cancer, in which almost 10,000 men older than 50 years were screened using various methodologies encompassing DRE, serum PSA levels, and TRUS, the cancer detection rate has remained about 5 to 6% for the initial year of screening and less than 10% through year three of longitudinal cohort studies, rates within the range expected if mostly clinical relevant cancers are being detected."[7]

ISSUE 3: It has been argued that aggressive early treatment of clinically localized tumors may be no more effective in prolonging survival and preserving quality of life than a "watchful waiting" approach, in which treatment is limited to the palliation of symptoms, as necessary.

If this were true without exception, arguments for the importance of early detection would be less compelling. Although a definitive resolution of this issue must await the results of clinical trials, researchers have attempted to use existing data to perform decision analyses of alternative treatments for clinically localized tumors. These analyses are being hotly debated in the literature and remain controversial. Nonetheless, at least one recent decision analysis of Medicare data[8] has been found by others in the field "to be a sound, useful description of the clinical reality surrounding the treatment decision for localized prostate cancer."[9] Its major findings were recently reviewed (September, 1995) by Albertsen at the International Conference on Prostate Cancer Screening, Early Detection, and Control, sponsored by the Centers for Disease Control and Prevention:

- "Patients over 65 with well differentiated tumors clinically localized to the prostate appear to have a minimal risk of disease progression."
- "Men age 65-75 years with moderate and especially poorly differentiated disease face a significant risk of dying from prostate cancer. These patients can potentially benefit from aggressive management. The benefit, however, diminishes as patients enter their early 70's, since competing medical hazards begin to play a more prominent role in overall patient survival."
- "For men over age 70, the potential benefits of surgery or radiation over conservative management were sufficiently small that patient preferences dictated the optimal strategy."[9]

Resolving the Questions

Research on the benefits of early detection and aggressive treatment of prostate cancer is proceeding on two fronts. Long-term clinical trials should provide definitive information to inform screening and treatment decisions in about 10 years.[7] Analysis of existing data with case-control designs and meta-analysis will help inform current decision-making, but given the limitations of these approaches, will remain controversial. A close attention to the literature is warranted, as relevant information is appearing at an accelerated pace.

Current Recommendations

The American Cancer Society recommends the DRE as part of a "regular annual physical checkup" for all men over the age of 40, with an annual serum PSA test to be added for men ages 50 and over and for men younger than age 50 who are African American or who have a significant family history of prostate cancer. The NCI recommends annual DRE, but does not recommend routine use of the serum PSA test. The American Urological Association, like the ACS, recommends annual use of the serum PSA test for men ages 50 and over and for men younger than age 50 who are at higher risk of developing prostate cancer. Neither the Canadian Task Force on the Periodic Health Examination nor the U.S. Preventive Services Task Force recommend for or against annual use of the DRE, and both recommend against routine use of the serum PSA test with asymptomatic men.[10]

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THE RHODE ISLAND MEDICAL JOURNAL

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THE RHODE ISLAND MEDICAL JOURNAL HERITAGE

90 Years Ago (November 1905)

Frank B. Sprague, MD, offers an original communication on ear complications of scarlet fever. He derides the passive attitudes of many practitioners when confronted with scarlatina, saying: "This is unfortunate for the science of medicine and for the human race and inexcusable in these days of enlightenment." Of the many otic complications, the author singles out otitis media as the most frequent and often the most serious. He indicates that about 3 to 9% of cases of scarlet fever will develop aural disease, with inflammation, discharge and ruptured tympanic membrane. He cites New York statistics regarding 5,613 deaf mutes. Of these 572 (over 10%) owed their condition to scarlet fever. In the Rhode Island School for the Deaf, of 201 cases admitted, 44 (21.3%) followed scarlet fever. The author then summarizes his own experience on the scarlet fever wards of Rhode Island Hospital. During a 6-month interval he observed 60 cases, with ten cases complicated by suppurative otitis media. In the great majority of these instances the cultured organism was the streptococcus although he mentions some cases with a mixed flora including diphtheroid organisms. He categorizes scarlatinal otitis into the acute serous variety, the acute suppurative form and the acute necrotic form. After a careful discussion of the presenting symptoms of each of these categories and a consideration of prognosis and therapy, he concludes: "Let me emphasize the importance of early recognition of the ear infections of scarlet fever; we should not expect and wait for the ear to "break and run" as is so often done, for this is but little short of criminal negligence, but undertake prompt treatment by paracentesis of the tympanum, as soon as there is the slightest indication of inflammation in the tympanic membrane . . ."

The care of the sick poor in their homes is the subject of a thoughtful essay by Jay Perkins, MD of Providence. Where poverty is, says the author, there also sickness is most frequently found. He cites some statistics from the tuberculosis clinic at Rhode Island Hospital, the majority were poor and most born overseas (particularly from Ireland and Italy.) He mentions logistic details that sometimes escape the attention of the busy clinician. For example, "There are many sick mothers who cannot go to the hospital without breaking up the home where there are many small children in the family . . ." The author stresses the role of the visiting nurse, sensitive to the educational level and cultural idiosyncrasies of the household, particularly the immigrant household, who thus becomes the key element in rendering material assistance to the sick who cannot use the hospital ward. He observes that the city of Providence is now covered by district nurses, but he wonders as to how poor a family must be before being eligible for such care. He then describes the London system of visiting nurses and the role of the Society for Organized Charity. The clinic physician, he emphasizes, must understand the conditions present in the patient's home before undertaking rational therapy; and only the visiting nurse can provide such information. One of the ultimate goals of these home visits is summarized by the author: "Our general plan is to arrange the whole domestic economy to the best interests of the patient and to provide against the dangers of infection to his household and associates." Home visiting also provides an important mechanism for the collection of epidemiological data on such public health problems as tuberculosis.

50 Years Ago (November 1945)

The lead article is a discussion of the pathology of coronary artery sclerosis and thrombosis by B. Earl Clarke, MD. The author reviews the various current theories in the evolution of the mural plaque and the ulceration, rupture or internal hemorrhage within the atheromatous plaque as the prelude to secondary lumenal thrombosis.

Arthur Geiger, MD, summarizes recent advances in the treatment of acute myocardial infarction stressing particularly the prompt relief of pain, provision for relative rest for the heart and steps to be undertaken for the anticipation, prevention and treatment of complications.

The neuropsychiatric aspects of coronary artery disease are discussed by Carl Binger, MD. Amongst other considerations, he analyzes the type of person who has a tendency to develop disease of the coronary arteries particularly those described as stubborn, self-willed with a compulsive devotion to completing tasks, often a compulsively ascetic martyr to his own ideals.

Alex M. Burgess, MD, summarizes the clinical aspects of acute coronary thrombosis, particularly the risk factors of age, sex and heredity.

The Committee on Postgraduate Education reports on the evolution of group practice in Rhode Island. (Most responding physicians favored such practicing arrangements.)

25 Years Ago (November 1970)

Ned F. Parish, executive vice president of the National Association of Blue Shield Plans discusses Blue Shield as a national system, exploring its role in the patient-physician relationship, the importance of freedom of choice and the strengths achieved through a national organization.

Joseph F. Sullivan representing the Rhode Island Medical Society Physicians Service analyzes guidelines to the negotiation of a capitation payment system within the context of group practice.

George Dunlop, MD, in behalf of Blue Shield of Massachusetts describes the evolution of Blue Shield and its many vulnerabilities.

The experience of cardiopulmonary resuscitation in a community hospital, and the effectiveness of such programs, is discussed by Doctors Abdul Hakim Khan and Edward Damarjian. They cite a survival rate of about 22%

Arthur G. Bonivart, MD, summarizes a case of segmental resection of primary duodenal carcinoma in a 70-year-old woman.

Marjorie E. Jansch, MD, J. Brian May, MD and Paul H. LaMarche, MD describe a case with an unusual mosaicism of two rare genetic anomalies (18p-/Gq- mosaicism with absent IgA).

A vignette of medical history (the surgical treatment of Garibaldi's bullet wound by the Russian surgeon Pirogov) is offered by Francesco Ronchese, MD

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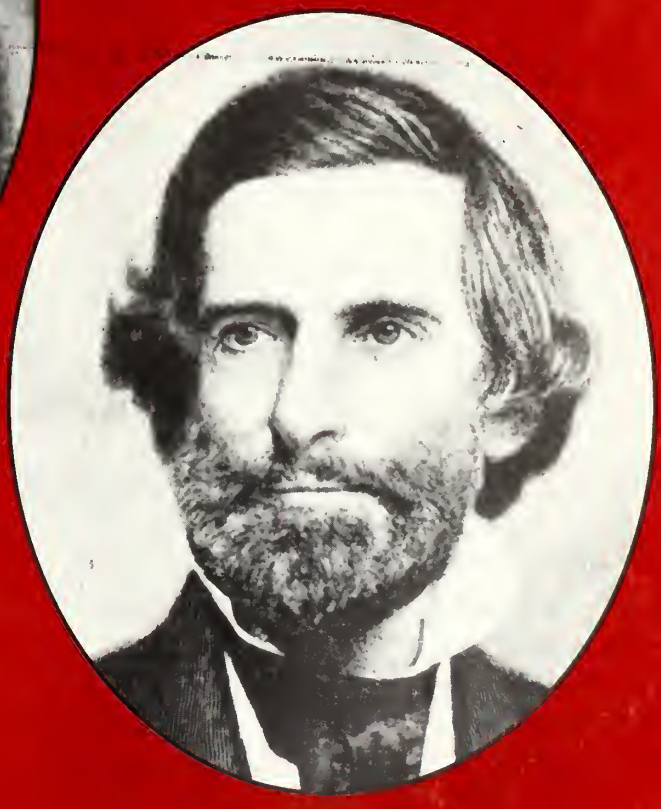

Ophthalmology

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COMMENTARIES

Ophthalmology and General Medicine

The papers in this issue of Rhode Island Medicine have been chosen to illustrate the broad interface between ophthalmology and general medicine.

In a thoughtful essay, which should be of interest to all medical practitioners as well as ophthalmologists, Robert E. Curran, M.D. considers the place of ophthalmology in medical practice today. He laments the gradual alienation of ophthalmology from mainstream medicine, offers several reasons why this has occurred, and provides a well reasoned case for a rapproachment. Hopefully, this issue of Rhode Island Medicine will foster such a renewed relationship.

Standard textbooks of surgery and anesthesiology have long carried statements similar to "it is imperative that the patient arrive the day of operation having taken nothing by mouth since the previous midnight." But is this policy necessary and beneficial to our patients? The paper "Nulla per Os (NPO) after Midnight Reassessed" points out that this doctrine is based on false assumptions. For 150 years patients have been dehydrated and starved unnecessarily and it is now time to adopt new policies in accord with present day knowledge and experience.

Temporal arteritis is a major cause of preventable blindness in the elderly. Frequently presenting with a bewildering array of signs and symptoms, prompt diagnosis and institution of treatment are critical because once blindness occurs it is irreversible. The history and elevation of the sedimentation rate are suggestive but definitive diagnosis rests on a temporal artery biopsy. R. Jeffrey Hofmann, M.D. reports the first published serires of in-office temporal artery biopsies which has proven to be a rapid, safe, effective, and cost-effective procedure.

King To, M.D. and associates from the Brown University/Rhode Island Hospital ophthalmology residency program present four case reports of patients they have seen within the past year. These include description of a resurgence of the "great imitator" in association with HIV, a benign but sight threatening systemic disease of bone, the most common parasitic disease of the CNS in the United States, and the CAR syndrome, all of which illustrate the main thesis of this issue that ocular involvement is an integral component of the diagnosis and management of a wide spectrum of diseases.

In this joyous season of
Christmas, the winter solstice
and Channukah,
the Publications Committee,
the Editorial Board
and the editors join in wishing
each of our readers
a relaxed and safe
holiday season.
May the new year bring each of
you good health, good learning,
professional fulfillment
and serenity.

The eyes are anatomically and physiologically unisexual. Drs. Figueroa and Snady-McCoy nevertheless review the ocular findings associated with systemic diseases which are predominantly found in women, changes in the eyes during pregnancy and finally the potentially adverse effects upon the fetus of medications commonly used in the treatment of eye disease.

D. Robbins Tien, M.D. extends this theme to the pediatric population. His paper describes six eye signs in children, each of which may be the first manifestation of a life-threatening condition, and in several instances a curable *life-threatening* condition.

Fortunately, most of us and most of our patients will not develop the illnesses described in the foregoing papers. All of us, however, will sooner or later have to face the correction of refractive errors. These may be farsightedness (hyperopia), nearsightedness (myopia), corneal asphericity (astigmatism) and loss of ability to focus (presbyopia). Elliot M. Perlman, M.D. describes the remarkable new advances in optical correcton with glasses and contact lenses and the exciting and complex field of laser and refractive surgery which will change the way we all see in the nineties and beyond.

The authors of all the papers in this issue of Rhode Island Medicine hold Brown Medical School teaching appointments. The present Brown Medical School is only 20 years old and even now does not have a Department of Ophthalmology. Nevertheless, Brown alumni and faculty have made significant contributions to eye care. For example, Professor Lauren Riggs developed the corneal electrode which has made modern electroretinography possible. Sidney Fox, M.D. of the class of 1923, a founder of ophthalmic plastic surgery and generous donor to the University, devised many original surgical procedures which have benefitted tens of thousands of patients. But few graduates of any university have had the impact on the blind and visually handicapped as that of two now largely forgotten Brown graduates described in "The Brown Cadmuses of the Blind".* It was Irving Beck, M.D., Rhode Island's eminent internist and preeminent medical historian, who brought to my attention the Brown University connection of Drs. Howe and Fisher.

Joseph L. Dowling, Jr., M.D.

**For those not up on their Bulfinch, Cadmus introduced the alphabet into Greece. This title was modified from a line in a poem by John Greenleaf Whittier.*

The Eyes Have It

To the scientist, schooled more intensively in sensory physiology than in classical poetry, the eye is but one of a number of sensory organs, a wondrous contrivance which captures beams of light and translates them into signals which ultimately provide a visual approximation of the outer world. The eye, then, is a receptive camera-like facility which defines the spatial features of the neighboring world, but an utterly useless instrument unless light impulses impinge upon its retina. All that is known about the nature of vision confirms the monodirectional character of this energetic process.

Nowhere in the annals of biology does evidence exist that the eye can emit as well as receive impulses. No scientist has ever recorded signals emanating from this receptive organ. Yet, somehow, our esthetic literature is strewn with allusions to the uniquely expressive powers of the eye, alleging it to be a communicator of complex data and the repository of human emotion, capable of conveying feelings from murderous hatred to tender love.

It is truly puzzling why such singular powers are repeatedly assigned to but one of man's sensory organs. No deathless sagas tell of ears capable of speaking or noses generating new odors. Only the eyes, contrary to all physical evidence, are thought to transmit awesome emotions, sometimes bestowing affection, other times striking terror in the hearts of bystanders, and at yet other times even hypnotizing hapless souls foolish enough to venture within their range. Rasputin is said to have ruled by the irresistible authority exerted through his unblinking gaze. And generals with steely eyes are said to command vast armies of men powerless before their mere glance. Other sources tell us of eyes which twinkle, eyes which radiate merriment and eyes through which native intelligence shines. One song even assures us of smiling Irish eyes, the lyricist failing to inform us as to what tangible optic features make an eyeball indisputably Gaelic.

Perhaps the unfettered poets know more about vision than the biologists who remain hostage to reality. Perhaps they perceive ocular attributes undreamed of in the banal world of medical physiology. Coleridge, for example, talks knowingly of the ancient mariner's glittering eye, a mere glance from which had stilled the gaiety of a wedding feast. Pope speaks of "the jaundiced eye" obviously reflecting upon some emotional state more profound than the icteric index. Graves speculates on "eyes quickened so with grief"; and Auden, indifferent to any inflammatory response, talks of eyes that are burning. Even the skeptical Shaw detects "bodily hunger in the eyes" of one of his characters. Yeats, from beleaguered Ireland, casts "a cold eye on life" and Isaiah in the distant Holy Land speaks darkly of "wanton eyes".

Yet some radiation akin to light *must* be generated by human eyes since so many authors have proposed its existence. Matthew declares that the light of the body is in the eyes. Moore affirms this emanation but stresses its transient nature ["... the eyes that shone, now dimmed and gone."] Shakespeare, more reliant upon words than upon visual imagery, rhapsodizes about the "heavenly rhetoric of thine eye" and in Troilis and Cressida again declares "there's language in her eye." Dickens goes still further by hinting that the emotions conveyed by a pair of eyes might not necessarily be in agreement with each other [". . . with affection beaming in one eye and calculation shining out of the other."] Truly, in the unphysiologic world of the bard, eyes may be variously fiery, unforgiving, longing, piercing, fearless, intransigent, anxiety-ridden, tender, appealing, lackluster, bold, humble, evil or even lacking in resolve. [What in truth does an eyeball need in order to assert that it lacks resolve? Is such a status conveyed by an iris which trembles, a pupil bereft of fortitude or perhaps an irresolutely equivocating cornea?]

In Gray's elegy we learn of still more astonishing ocular capabilities. We learn that one may read a "total history in a nation's eye." What wondrous faculties must rest in these organs that they can distill the entire chronicle of a people into orbs a mere 24 millimeters in diameter.

Of all of our many organs only the eyes prompt such outrageous hyperbole; and perhaps, on deeper reflection, rightly so. Certainly each of our busy organs work diligently in their fashion, keeping the machinery of life functioning, often silently day upon day. But the eye additionally serves as the tireless messenger bringing the outside world to us in vivid detail, transporting us well beyond the grubby existence of the sightless earthworm or mole. Vision reduces our isolation, bringing us incandescent excitement, color, enlightenment and even the transcending opportunity for cultural fulfillment. The eyes see – and in seeing, enrich our existence. Though voiceless, the eyes nonetheless manage to speak for us, and in some obscure way make our state of mind, even our inner spirit, more luminously clear. Surely, with such endowments, the eyes may be permitted a little exaggeration.

Stanley M. Aronson, M.D.

Ophthalmology and the Old Brown Medical School

This issue of *Rhode Island Medicine* seems an appropriate place to seek ophthalmological roots in the old Medical School at Brown University. The first Brown Medical School, founded in 1811, was the third oldest medical school in New England – after Harvard and Dartmouth – and the seventh oldest in the United States. In historical perspective, it had the potential to develop into a great medical school, because Providence was soon to have in residence both Dr. Charles V. Chapin and the Butler Hospital, giants in two of the major health spheres of the mid-19th century, infectious disease and mental illness. However, such was not to be.

The beginning of the end for this fledgling medical school – only 16 years old – came with the installation of President Francis Wayland in 1826. Brown was described at that time as "marked by idleness and dissipation on the part of students." Wayland believed it to be the duty of the faculty to impose discipline and order on the campus. A special meeting of the Corporation was called for March, 1827 and, at the behest of Wayland, who is widely considered one of the outstanding college presidents of the 19th century and who was himself initially trained in medicine, the Corporation passed the following edict. "Resolved that no salary or other compensation be paid to any professor, tutor or other officer, who shall not, during the course of each and every term occupy a room in one of the colleges and assiduously devote himself to the preservation of order and the instruction of the students."

This demand was clearly unacceptable to the medical faculty which had never been in college residence and largely supported itself through outside practice. Other professors resigned and considerable controversy ensued both within and without the college. The imposition of this arbitrary and inflexible rule was the death knell of the medical school. There is reason to believe that Wayland did not intend the permanent disssolution of the medical school, but nevertheless this event was not without certain benefits to him. For example, it solved a sticky problem in town-gown relationships which had developed when a barrel of specimens had been inadvertently or otherwise left outside the anatomy laboratory. A group of undergraduates happened by and playfully rolled the barrel down College Hill. At the corner of Benefit Steet, the barrel came against some obstruction and the head of the barrel came off followed by a human head and a miscellaneous collection of other

bones, much to the consternation of the onlooking citizenry. The professor of anatomy later arrived to claim his property "but public opinion demanded a prompt and decent burial" and public antipathy to the anatomy laboratory remained at a high level. A medical student who was implicated in this affair found it convenient to visit an uncle in the country and remained there until the controversy had blown over. The demise of the medical school also made some additional funds available and the following year the President was able to arrange a 50% increase in his salary to the munificent sm of $1,500 annually.

It was the custom at each medical school commencement to award honorary as well as earned degrees. The graduation list of 1825 records the presentation of an honorary M.D. degree to one Edward Reynolds. There is no other record of this man in the Brown archives but his career is worthy of note. He was born in Boston on February 28, 1793. He matriculated at Harvard at 14 years of age and received AB and AM degrees in 1811 and 1814, respectively. Following graduation he undertook a preceptorship in medicine under the prominent Boston physician, John Collins Warren. He then followed his preceptor's example and traveled to Europe to study, principally in London and Paris. In London at Guy's and St. Thomas', young Reynolds studied medicine, surgery, midwifery and he also took a "ticket" to the Eye Infirmary. Among his fellow students were two Americans from New York, Edward Delafield and John Kearney Rodgers, and also a frail young Englishman by the name of John Keats. Reynolds, Delafield and Rodgers established life-long friendships. Although we know that Keats and Reynolds took some of the same lectures, there is no record to tell us whether they were friends or merely acquaintances. In any event, Keats never practiced. Following completion of his medical training, he returned to Italy to spend his days writing until his untimely death from tuberculosis in 1821 at the age of 26. Reynolds, Delafield and Rodgers, through their study in London, recognized the lowly state of ophthalmology in the United States. Reynolds wrote, "One of the most remarkable facts in the history of medicine is the utter neglect of the study of diseases of the eye. This profound ignorance is to us who are able to appreciate the suffering and poverty consequent upon uncured disease of the eye, almost inconceivable" and he determined to overcome this lamentable state of affairs.

In October of 1824, upon his return to Boston, Reynolds opened a free clinic for the treatment of eye diseases for those who could not afford private care. The demand was so great that the clinic soon became overburdened. Reynolds, with his partner John Jeffries, then organized a committee of distinguished Bostonians who took the financial and legal steps necessary to found an eye hospital. Thus, Edward Reynolds – M.D. from Brown University – was the man chiefly responsible for the founding of one of the most distinguished eye hospitals in the United States, The Massachusetts Charitable Eye and Ear Infirmary. In 1822, two years previously, his friends from New York, Delafield and Rodgers had founded the New York Eye and Ear Infirmary, the oldest eye hospital in the western hemisphere.

In the course of his training, Reynolds had overlooked one small detail. He had forgotten to obtain an M.D. degree. This oversight was remedied at the Brown Commencement of 1825 and Dr. Reynolds went on to a distinguished career in Boston as ophthalmologist and teacher.

How or why this honorary degree was arranged is not known. There are no records in either the Brown archives or Dr. Reynolds' papers. As to what actually happened, we can only speculate. Reynolds, at age 32, was not sufficiently established or renowned to receive an honorary degree on merit. There is no record that he lectured or taught Brown medical students, or attended classes. There is no reason to believe that honorary degrees, like the indulgences of the Middle Ages, were for sale. The most likely explanation is that he had a patron who made the necessary arrangements. That patron was likely to have been Dr. Usher Parsons, Brown professor of anatomy and surgery, and undoubtedly the most distinguished member of the medical school faculty. He had served as Oliver Hazard Perry's surgeon at the Battle of Lake Erie. He was a prolific author of medical articles, he served as acting president of the American Medical Association, and later he was the driving force behind the founding of the Rhode Island Hospital. He married a sister of Oliver Wendell Holmes, M.D., and despite her death at a young age, the two men maintained a lifetime friendship and have left an extensive correspondence.

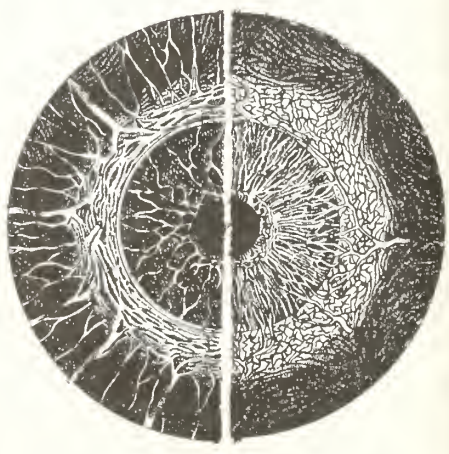
There is no documentation of a relationship between Usher Parsons and Edward Reynolds, but there are clues available. Both were preceptees of Dr. John Collins Warren, professor of surgery at Harvard, a founder of the Massachusetts General Hospital and the New England Journal of Medicine. Dr. Warren had an interest in eye surgery. He reported 11 eye operations at the Massachusetts General Hospital between 1821 and 1823, the two years before the opening of the Eye and Ear Infirmary. Dr. Parsons also had an interest in eye surgery. In 1818, while on medical leave in Naples, Parsons visited the local medical facilities and was especially impressed by the Hospital for Diseases of the Eye where he made rounds and observed surgery. Charles Usher Parsons, writing about his father in 1870, reported that he frequently operated for cataract, no mean undertaking in those days when laudanum, brandy, and words of encouragement were the only anesthetics available.

Perhaps most convincing of a relationship between Parsons and Reynolds is a review of the two other honorary degree recipients at that 1825 commencement. One was Dr. Usher Parsons himself and another went to John Jeffries, Reynolds partner and co-founder of the Massachsuetts Eye and Ear Infirmary. Both Parsons and Jeffries had previously earned M.D. degrees.

An interesting notice appearing in Volume II of *The Boston Medical Intelligence* (1825-1825) reported, "Dr. Usher Parsons, Professor Surgery in Brown University, has recently established an infirmary in Providence for diseases of the eye." Nothing more is heard of this eye infirmary which perhaps ceased to exist with the dissolution of the Brown Medical School. One can only speculate as to what might have developed from the Parsons-Reynolds relationship and the Providence Eye Infirmary if President Wayland had found some alternative method of imposing discipline on his recalcitrant student body.

For 150 years, the famous epitaph penned by John Keats for his gravestone - "Here lies one whose name is writ in water" - was far more prophetic for the first Brown Medical School than for Keats himself.

Joseph L. Dowling, Jr., M.D.



Some Observations on Ophthalmology and Contemporary Patient Care

Robert E. Curran, MD

Almost a century ago the eminent physician, Sr William Osler, referred to ophthalmology as the "Queen of the Medical Sciences." His basis for such a reference is not entirely clear but one would wonder if ophthalmology would merit such a title today.

As clinical medical practice evolved during this century the ophthalmologist generally related well to his clinical colleagues when caring for the patient. Serious patient care tended to be hospital centered and the ophthalmologist was part of this environment. Timely ophthalmological input was contributory in many clinical situations, to the benefit of the patient as well as the involved physician.

In recents years ophthalmology has become estranged from the mainstream of medical practice. The era of specialization has been well known to produce degrees of fragmentation of medical care but, until relatively recently, the ophthalmologist seemed to be more regularly involved with general medical patients. Now it seems that the patient with ocular complaints sees the ophthalmologist last, or not at all, and often only after a series of negative laboratory investigations.

What accounts for this phenomenon? What is the background for this apparent separation of the ophthalmologist from the medical patient?

A primary consideration must be that the average ophthalmologist now rarely has any hospitalized patients. Ophthalmological surgery is almost exclusively outpatient often remote from a hospital setting. Conditions such as bacterial corneal ulcers, acute glaucoma and traumatic hyphema which in the past occasioned a hospital admission are now routinely treated on an ambulatory basis. With the ophthalmologist removed from the hospital, he loses much in the way of contact with his colleagues in other specialties. There is an inevitable withdrawal to the office practice with an emphasis on strictly ocular problems and perhaps less interest in systemic medical considerations.

A second consideration involves the dramatic improvement in noninvasive imaging studies in the past two decades. The decision to do a cerebral arteriogram or a pneumoencephalogram in a patient with neuro-ophthalmologic symptoms was a very cautious and considered process that usually mandated ophthalmological input. Such decisions have now become trivial rather than critical with the ease and availability of CT and MRI scanning.

In recent years of ophthalmology has become estrange from the mainstream of medical practice.

A third factor has been apparent for years: the economic value of seeing medical patients is usually not favorable. It is certainly more rewarding from a monetary point of view to see patients with surgical conditions. Some ophthalmological practices with a heavy surgical emphasis have created a negative image among their medical colleagues and thus referrals may be reluctant. Primary physicians, appropriately enough, have a tendency to protect their patients from surgical intervention and this attitude may also make them hesitant to refer patients to an ophthalmologist.

Lastly, the very rapid pace of innovation and change in all areas of medical practice further isolates the ophthalmologist. The ophthalmologist several years away from his formal medical education can easily be intimidated by, for example, the rapid changes in the pharmacologic and invasive management of cardiovascular disease. The vast array of new systemic medications is difficult to keep up with. On the other side, the major advances in ocular diagnosis and treatment tend to augment the veil of mystery that has historically surrounded ophthalmology. The ophthalmologist and the primary care physician probably understood each other better in the past when change was less rapid and their common medical training was more mutually comprehensible.

So ophthalmology in some ways may be filling a remote seat in the theater of modern medical practice. What does this mean? What is the significance of this relative isolation of ophthalmology?

If the ophthalmologist is viewed merely as a provider of "eye care services" and the prescriber of spectacles, it may not mean very much. The usual "vision care rider" attached to many health insurance plans relates more to optical stores and shopping malls and really has little to do with health and disease.

But the ophthalmologist as a physician, integrated into the system of medical care, provides a real service to the patient and to the medical community. The competent ophthalmological evaluation of the patient with acute visual loss or the abrupt onset of diplopia usually provides a specific diagnosis or at least provides a direction to the medical evaluation of the problem. The ophthalmologist can calm patient and physician anxiety and often obviate the need for costly MRI or CT scanning or other testing. Patients with ischemic optic neuropathies and vasculopathic oculomotor palsies all too often undergo needless and costly diagnostic evaluations which uniformly prove to be negative. The patient with the onset of "migraine" visual symptoms should be handled by a single ophthalmological evaluation and an appropriate exaplation. No studies are necessary.

Most diabetic retinopathy does not require laser therapy. Most diabetic retinopathy does not require routine fundus photographs. Periodic ophthalmologic assessment should readily identify

ABBREVIATIONS USED
CT: Computerized tomography
MRI: Magnetic resonance imaging

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candidates for laser therapy in a simple and efficient manner.

Cultures are not necessary for the vast majority of external ocular infections. Most eyelid infections do not require a complete blood count or systemic antibiotics.

The ophthalmological examination should be one of the most cost-effective options in the medical practice. Virtually all the ophthalmologists in this area accept the fee schedules allowed by federal Medicare and most insurance plans. An ophthalmological evaluation, therefore, could range from a maximum of $79.00 to a minimum of $37.00. These numbers seem quite reasonable (in fact remarkable) if other laboratory evaluations are eliminated or minimized and if therapy and/or reassurance is promptly rendered.

Non-medical eye examinations, on the other hand, frequently confuse rather than clarify the nature of visual complaints or problems. Minimal or non-disease of the eyes is often exaggereated. Patient anxiety is often heightened. A minor problem can be reported as a major issue to a primary physician who is prompted to embark on an unncessary or not immediately necessary work-up.

In the setting of the large comprehensive hospital, ophthalmology consults are readily available. A recent compilation of the Rhode Island Hospital experience with ophthalmological consults over a full year (J. Ducharme, M.D., personal communication) describes a wide range of problems evaluated. A similar utilization of ophthalmology in the office-based arena should be the rule. The timely ophthalmological evaluation should be an efficient and effective means of assessing and resolving a variety of medical problems.

Ophthalmology and primary care medicine should have a good working relationship. As managed care and gatekeeping become greater factors in medical practice, the ophthalmological examination should be recognized as a very easy and cost-effective approach. Primary physicians should do the simple thing first: get an ophthalmological opinion. Ophthalmologists should be sure to do the appropriate thing: be available and then communicate with the primary physician.

Osler was a great proponent of the eye examination and ophthalmoscopy as part of the general medical evaluation of the patient. In this day and age such expertise may not be entirely practical for all primary physicians but, with a generous supply of ophthalmologists and no shortage of communication tools, the ophthalmologist should be able to make a valuable contribution to patient care.

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"Nulla per Os [NPO] After Midnight" Reassessed

Joseph L. Dowling, Jr., MD

The transition from inpatient to outpatient surgery for most eye operations and a wide variety of other surgical procedures has been a major advance in medical care. At the present time 60% of all operations performed in the United States are on ambulatory patients, rising to 85% within the next year. The rationale, efficacy and safety of ambulatory eye surgery have been well documented.[1,2] Contrary to a once commonly held concept, ambulatory surgery is not merely the same procedure as inpatient surgery except that the patient goes home without an overnight stay. Ambulatory surgery has led to a reconsideration of perioperative management based on the principles of minimal use of sedation, minimal disruption of normal routine, minimal patient stress and enhancement of the patient-doctor relationship.[1,2]

For 150 years, the older "nulla per os (NPO) after midnight" has been standard practice before all elective surgery. This rule did not distinguish between inpatients and outpatients, adults and children, liquids or solids or even general or local anesthesia. The purpose of this paper is to determine current policy and custom in Rhode Island regarding preoperative oral intake, to discuss the rationale and presumed justification for these policies, and to make new recommendations based on present day knowledge.

Survey and Results

Thirteen hospitals and surgicenters in Rhode Island were surveyed.* Each was questioned as to whether it maintained or enforced a policy or custom which required NPO after midnight before surgery. Further inquiry was made as to whether policies applied equally to local and general anesthesia, whether a distinction was made between liquids and solids, and whether exceptions were made for late scheduled cases. Small sips of water to take oral medications on the morning of surgery are usually allowed and not considered a violation of the NPO order.

The results, tabulated in Tables 1 and 2, are consistent with a 1991 national survey[3] of 150 randomly selected operating facilities (hospital operated, privately owned, and proprietary), which revealed that for cataract surgery under local anesthesia 72% adhered to the NPO after midnight rule whereas the other 28% allowed unrestricted oral intake on the day of surgery.

Withholding fluids preoperatively is not only of no benefit to patients but may even be harmful.

For operations scheduled in the afternoons, three NPO facilities make exceptions for surgery scheduled under local anesthesia and two facilities allow early morning fluid intake for patients scheduled late under general anesthesia.

Gastric Physiology

Intragastric pressure is ordinarily maintained by sustained contractions of the proximal stomach muscles. After ingestion of a meal, the contractions are inhibited and the stomach is able to contain a large volume under a relatively low intragastric pressure. Liquids and solids are digested separately in the stomach by distinctly different mechanisms and leave the stomach at different rates.

Fluids leave the stomach rapidly at a rate which is determined by the gastric volume and the gradient between the intragastric pressure and that of the duodenum. The composition of the gastric fluid is another factor which influences gastric emptying time, being more rapid at neutral pH, iso-osmolarity, and caloric inertness. Gastric emptying time is an issue of critical importance in considering the necessity for and duration of preoperative fasting. In 1825, Beaumont, the pioneer gastric physiologist with his famous patient Alexis St. Martin, observed that fluids emptied from the stomach in less than one hour while solids took considerably longer. This observation has been confirmed many times by a variety of modern techniques. Using ultrasonography, Marzio[4] demonstrated that half of 500 cc. of saline emptied from the stomach in fifteen minutes and was entirely gone in thirty minutes. Sandhar[5] studied gastric aspirates of phenolsulfonthalein-dyed fluid in children having surgery under general anesthesia. He found two-thirds of the dye to have emptied from the stomach in one hour and no detectable dye in any sample after 135 minutes. Dual isotope techniques demonstrate simultaneously the difference in egress times for liquids and solids.

The digestive process for solids is slower and involves two phases. The upper stomach serves as a holding space while the lower stomach functions as a grinder which converts the solid elements of the meal into a thick liquid chyme containing on transit particles larger than 2.0 mm. The grinding process is largely accomplished by rhythmic peristaltic waves, which increase in amplitude and velocity as they move distally, assisted by acid peptic digestion. Large particles are retropelled at the pylorus for further grinding and those solids which are indigestible are later eliminated by a different mechanism. Solids can pass through the stomach in as quickly as 90 minutes or as slowly as six or more hours depending on the volume, content and a variety of other factors such as anxiety, medication and gastrointestinal disorders.

Pathophysiology of Aspiration

Aspiration pneumonitis is a serious complication of passive gastric regurgitation occurring when the intragastric pressure exceeds the tone of the lower esophageal sphincter. In 1946, Mendelson, an

ABBREVIATIONS USED
NPO: Nulla per os (nothing by mouth)

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Table 1. – Policy for Local Anesthesia, Rhode Island Operating Rooms

1) Maintain NPO after midnight	7
2) Maintain NPO for solids after midnight but oral fluids allowed	2
3) Breakfast and oral fluids allowed ad lib	4*

*One facility maintains NPO for first case only

Table 2. – Policy for General Anesthesia*, Rhode Island Operating Rooms

1) NPO after midnight	10
2) No food after midnight but oral fluids allowed	2

*One surgicenter does no cases under general anesthesia

obstetrician, published his classical paper[6] on aspiration pneumonitis, now often referred to as Mendelson's syndrome. Using rabbits, he demonstrated that significant morbidity and mortality resulted from aspiration of large volumes of fluid producing a "drowning" effect, from aspiration of strongly acidic fluid and from mechanical airway obstruction by aspiration of solid particles. He observed that rabbits could survive the inhalation of large volumes of fluid of neutral pH but the pneumonitis had a progressively fatal outcome as the pH declined. Patients are generally considered to be "at risk" if they have a gastric volume $\geq$ .4 cc./kh. and a pH $\leq$ 2.5. These figures, however, have been extrapolated from animal data and may be inaccurate for humans. In the overall population of men, women, adults and children there is a wide discrepancy in normal gastric volumes and gastric fluid pH. Sixty percent of adults and 75% of children have normal gastric contents in the "at risk" category, whether fasting or nonfasting.

In clinical practice, pulmonary aspiration is a rare occurrence which precludes meaningful prospective studies of its cause and prevention. Gastric volume and pH are traditionally used as clinical indicators of the risk of aspiration pneumonitis. Olsson,[7] reviewing 185,000 general anesthesias in Sweden, found the incidence of pulmonary aspiration to be 4.7/10,000 operations, the mortality to be 5% of that, and no deaths in the elective surgery group. The overall mortality was one death in 46,340 general anesthetics. In the United Sates, Keller[8] reported an incidence of 1.7/10,000 general anesthetics while Schreiner[9] in 1994 reported no aspiration pneumonia in 50,000 consecutive pediatric surgical cases including both inpatients and outpatients at the Children's Hospital of Philadelphia using a non-depolarizing muscle relaxant to facilitate intubation. Patients who do sustain pulmonary aspiration usually have recognizable predisposing factors such as emergency surgery, difficulty in airway management, gastroesophageal abnormalities, a recent full meal, morbid obesity, or depressed consciousness from drugs or injury. There have been no reports in the medical literature of pulmonary aspiration in surgery under local anesthesia.

Pharmacological adjuncts have been suggested to decrease gastric volume and neutralize acidic pH. These include antacids, histamine-2 receptor antagonists such as ranitidine, metaclopramide, a prokinetic drug, and omeprazole, a supressor of gastric acid secretion. In practice these agents are rarely used because of possible side effects and the low incidence of pulmonary aspiration but they may be useful in special situations.

Discussion

The rationale for limiting oral intake for a protracted period of time before surgery is to provide an "empty stomach," in which the gastric volume is reduced and the pH is less acidic. Mendelson demonstrated that the severity of pulmonary damage is greater from a large volume aspirate with a low pH but what neither he nor anyone else has ever demonstrated is that fasting reduces gastric volume or neutralizes gastric pH. Normal gastric contents consist of endogenous secretions and swallowed saliva as well as ingested food and fluid. Gastric secretions and saliva accumulate in the stomach under fasting conditions up to 50 cc per hour, twice the volume considered to be a risk factor for pulmonary aspiration. Numerous investigations[10] involving both inpatients and outpatients have consistently shown that the intake of clear liquids in healthy patients up until the time of surgery does not have any adverse effect on gastric volume or pH. Studies[11,12,13,14] of gastric aspirates of comparable groups of patients undergoing similar surgical procedures under general anesthesia have repeatedly shown an increase in gastric volumes in those patients taking even large volumes of clear fluids up to two hours before surgery as compared to those fasting at various intervals back to midnight. The pH values in these studies have been either essentially the same or improved in the non-fasting groups. 150 cc of clear liquid taken shortly before surgery has actually been shown to decrease gastric volume and improve pH, presumably by stimulating peristalsis.

Children are often considered to be at increased risk for gastric aspiration because they normally have a relatively large gastric volume and low pH. However, studies allowing one group of children unlimited quantities of clear liquids up to two hours before surgery show no difference in the amount or character of gastric aspirates in these children and another group required to fast for 6 or more hours. The Children's Hospital had allowed unlimited clear fluids up to two hours before surgery to 25,000 consecutive healthy elective surgery patients without problem or complication related to oral intake.

Adults and children restricted to NPO after midnight average between 9 and 13 hours without oral intake. This preoperative starvation results in thirsty, hungry, and sometimes dehydrated and hypoglycemic children and adults. Children may be uncooperative and adults are often restless which, under local anesthesia, for eye surgery may prolong or even compromise the surgical procedure. A report from the Mayo Clinic,[15] which no longer adheres to the NPO edict, described a significant incidence of headache, malaise and irritability in NPO patients denied their morning coffee. Parents have observed that children allowed fluids up to two hours before surgery tend to be less irritable than children on prolonged fasting and parents whose children have had surgery on both the NPO regime and the liberal fluids regime, have described an overall better experience with the latter procedure. Recently hyperglycemia has been implicated as a cause of neurological damage during periods of hypoxia. The ingestion of glucose containing solutions before surgery could eliminate the potentially harmful routine use of glucose-containing solutions during general anesthesia.

Surgery under local anesthesia requires different considerations. These patients in

the days of inpatient eye surgery were often heavily sedated. Depression of respiration and other reflexes was not uncommon so that pulmonary aspiration was a realistic concern. Today, patients receive little or no preoperative sedation as seen in a large series[16] in which less than 1% of cataract patients required any preoperative medication. These patients are alert and cooperative with intact esophageal and gastric reflexes and there appears to be no justification for any restriction of oral intake. A retrospective Rhode Island study[3] of two randomly selected groups of 150 patients each, who had undergone cataract surgery in the same operating room with the same anesthesia and nursing staff, showed no difference in the complications or outcomes between one group on NPO after midnight and the other group on breakfast and fluids *ad lib* until surgery. Maltby and Hamilton[16] have reported 30,000 consecutive patients undergoing eye surgery under local anesthesia with a normal breakfast, solids included, on the morning of surgery and fluids up to the time of operation with no observed instances of pulmonary aspiration or other complications related to the oral intake. For over 15 years in more than 10,000 operations our ophthalmology group has allowed and encouraged all local anesthesia patients to have their normal breakfast on the morning of surgery. We have not been aware of any problems and we have found the procedure beneficial to the patients' general welfare and overall surgical experience.

Summary and Conclusion

The concept that fasting produces an "empty stomach" has been shown to be incorrect. Numerous studies demonstrate that fasting neither diminishes gastric volume nor decreases gastric acidity and the risk of pulmonary aspiration is not increased by the preoperative intake of clear liquids. Nevertheless, most surgeons and anesthesiologists continue to adhere to the traditional NPO after midnight tradition, a tradition which should be abandoned. Withholding fluids preoperatively is not only of no benefit to patients but may even be harmful.[17] Based on current knowledge and experience, the following guidelines, which represent a beneficial and humane advance for all surgical patients, are recommended.

1) Adults and children undergoing elective surgery under general anesthesia as inpatients or outpatients in good health (ASA Class I or II) and without specific contraindications (such as morbid obesity, gastrointestinal disease, etc.) should be allowed and encouraged to drink clear fluids up to two hours before surgery.

2) Patients undergoing elective surgery under general anesthesia and major regional blocks that might require conversion to general anesthesia should remain NPO for solids and non-clear liquids for a minimum of six hours before scheduled surgery.

3) Patients undergoing elective surgery under regional local anesthesia in good health and without specific contraindication should be allowed and encouraged to have their normal breakfast and fluids as desired on the day of surgery.

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Six Signs in Children with Life-Threatening Implications

D. Robbins Tien, MD

Of the multitude of eye signs which may be encountered in a pediatric practice, most result from abnormalities specific to the eye, and are of limited systemic consequence. Occasionally, however, it is the eye where a potentially life-threatening disease first manifests itself. In this paper I will review six ocular signs which may indicate a life-threatening disorder: *Leukocoria, strabismus, papilledema, retinal hemorrhages, proptosis,* and *aniridia.* Some of these signs are relatively common, i.e., strabismus, while others are seen quite rarely, i.e., aniridia (absence of the iris). And fortunately, even when present, only a minority of children presenting with these signs will be afflicted with a potentially fatal disease. Nonetheless, the presence of any of these signs warrants serious attention as they may be the physician's first clue that a life-threatening disorder exists.

Figure 1.

Leukocoria, or a white pupil (Fig. 1)

The pupil is analogous to the aperture of a camera, and its constantly changing size functions as an automatic "f" stop regulating the amount of light entering the eye. In reality then, the pupil is not a structure at all but the absence of a structure, a hole in the center of the iris which we perceive as black because of the relative darkness of the interior of the eye. Anything which blocks, or reflects back, light passing through the pupil will destroy the normal "blackness" of the pupil and give it a disturbing "whitish" appearance.

A standard question posed to candidates sitting for their ophthalmology boards is the differential diagnosis of leukocoria. The reason is that the most common presenting sign of retinoblastoma is a white pupil. This whitish-yellow tumor grows from the retina inside the eye reflecting back entering light hence producing leukocoria.

. . . it is true that many serious systemic disorders disclose themselves in the fundus of the eye.

Retinoblastoma is the most common eye malignancy of childhood.[1] 90% of the time it presents in children younger than three years of age, and now occurs with a frequency of 1 in every 14,000 births as compared with only 1 in 20,000 births a generation ago. Advances in genetics have mapped the tumor to a mutation of a specific gene on the long arm of chromosome 13. The tumor is classicially inherited in an autosomal dominant fashion, but most cases are, in fact, sporadic. Clinically there are two forms depending on the timing of the mutation: If the mutation occurs at the germ cell level, the patients will develop multiple tumors in both eyes and be younger than patients whose tumors develop from a somatic mutation in the developing retina of one eye.

Modern ophthalmology is eminently successful in treating retinoblastoma – as long as the children are referred promptly. Death occurs now only if evaluation and treatment have been delayed long enough for the tumor to extend outside the eye. Treatment techniques include surgery, radiation, cryotherapy and laser ablation of the tumors. Modern staging and treatment techniques usually permit the preservation of sight even in bilateral cases.

Leukocoria can, of course, be caused by disorders other than retinoblastoma and,

ABBREVIATIONS USED
CT: Computerized tomography

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Figure 2.

indeed, usually is, but the first thought which should cross any practitioner's mind when a young child presents with leukocoria is retinoblastoma.

Strabismus (Fig. 2)

Strabismus, or misalignment of the eyes, is a relatively common problem in the pediatric age group with an incidence of around 4%. It is usually an isolated problem without grave systemic implications. However, in a small but significant number of cases the strabismus is a manifestation of a serious neurologic disorder. While it is true that the presence of serious neurologic disease is usually heralded by more than ocular motility disturbances, several times a year patients are referred with strabismus as the earliest manifestation of serious neurological disease. The development of double vision in a child caused by the development of a cranial nerve palsy and the resultant strabismus is a most ominous finding, and neuroimaging to rule out brainstem neoplasms or other structural abnormalities is virtually always indicated.

Strabismus indicative of serious underlying disease tends to be incomitant, that is the presence or size of the deviation varies with gaze position, but again this is not always the case, and making such a determination often requires considerable skill.

Papilledema (Fig. 3)

We all learn in medical school that increased intracranial pressure produces swelling of the optic nerve head and that this sign demands an urgent work-up. Though the open fontanelles in infants permit expansibility of the cranium, infants, as well as children, can develop papilledema. In fact, papilledema is more likely to be an early sign of brain neoplasia in children for the simple reason that 70% of brain tumors in the pediatric age group are situated in the posterior fossa, whereas most adult brain tumors are supratentorial.[2] The proximity to the fourth ventricle and the aqueduct of Sylvius often leads to early and marked elevation of intracranial pressure, often before other neurologic signs appear. Cerebellar astrocytoma, ependymoma and medulloblastoma account for the vast majority of childhood posterior fossa tumors.

The ophthalmologist can be of great assistance in evaluating a patient with suspected papilledema since the specialized lenses now available permit stereoscopic viewing the disk with excellent magnification. There are a number of physiologic conditions which are easily confused with papilledema, and the ophthalmologist can usually distinguish easily between true papilledema and pseudopapilledema with a careful eye exam, saving patients and their loved ones much anxiety, not to mention avoiding costly, unpleasant and occasionally risky work-ups.

Retinal Hemorrhages (Fig. 4)

The blood vessels of the retina provide the physician with a privileged glimpse of the body's vasculature. Indeed, it is claimed by some ophthalmologists that almost all systemic disease can be diagnosed by careful ophthalmoscopy! While I do not share such hubris, it is true that many serious systemic disorders disclose themselves in the fundus of the eye.

The most common reason for ophthalmic consultation at Hasbro Children's Hospital is to rule out child abuse. In 1964 Kiffney found that retinal hemorrhage is the most common ocular finding in child abuse, with an incidence of 65-89%.[3] The mechanism of retinal hemorrhaging in child abuse is probably multifactorial, but the hemorrhages that occur may last for many months and thus be helpful in assessing child abuse even when the actual episode of abuse is remote. In contrast, the benign retinal hemorrhages which often occur during

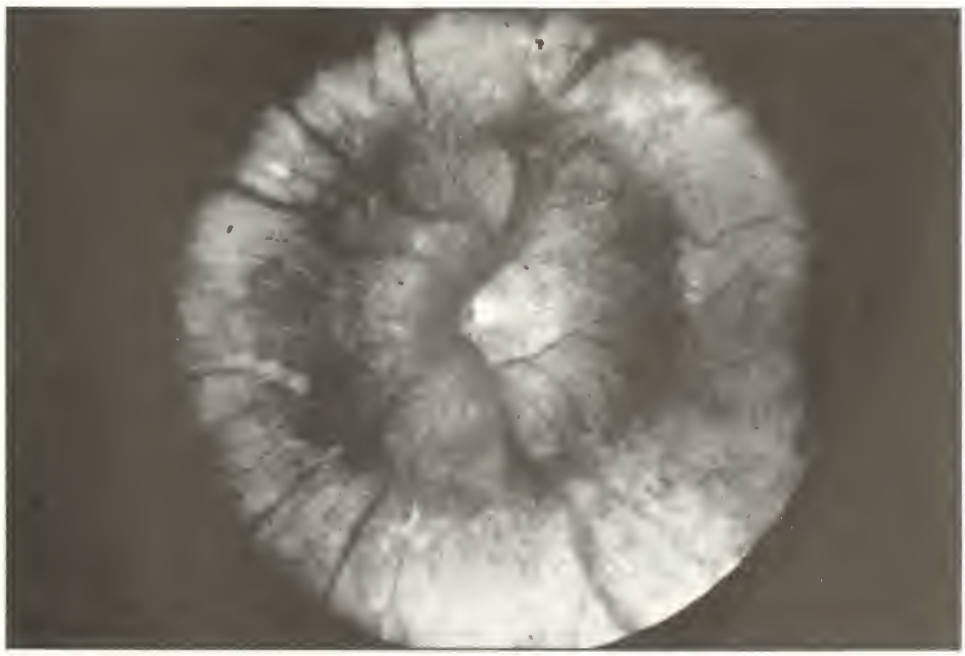

Figure 3.

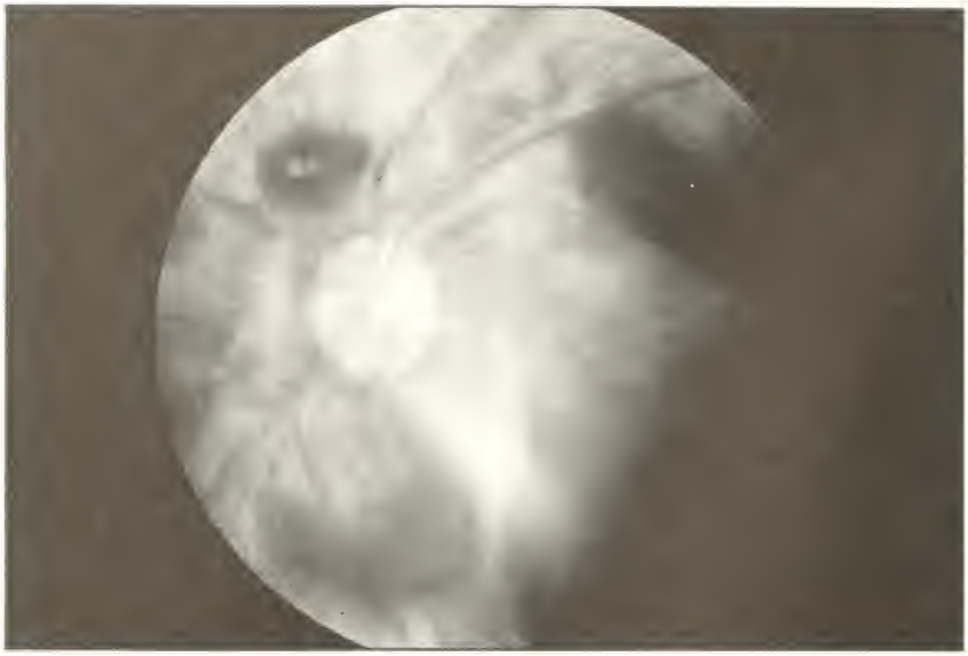

Figure 4.

vaginal delivery disappear within days. Therefore, the presence of retinal hemorrhages in an otherwise healthy infant or child should raise suspicion of child abuse.

Acute lymphoblastic, myelogenous or monocytic leukemias frequently produce retinal hemorrhages easily visible with the direct ophthalmoscope. Other blood dyscrasias may also produce retinal hemorrhages, though not as commonly as the leukemias.

Other serious disorders associated with retinal hemorrhages include cytomegalovirus infection, bacterial endocarditis, subarachnoid hemorrhage, sickle cell hemoglobinopathies, and diabetes. Suffice to say, the detection of retinal hemorrhage is an important finding demanding further investigation.

Proptosis (Fig. 5)

Proptosis, sometimes called exophthalmos, is caused by a space-occupying disorder of the orbit which displaces the eye from its normal position. It may be an obvious sign in some cases or it may be subtle and require measurement with specialized instruments.

Cellulitis is the most common orbital disease in children and demands emergent attention. It most commonly develops as a complication of sinusitis. These patients are usually septic and require orbital CT scanning, nasopharyngeal cultures, blood cultures, hospitalization, and intravenous antibiotics. The most common bacteria causing orbital cellulitis are *Hemophilus influenzae, Staphylococcus aureus* and *Streptococcus pneumoniae*. Potentially fatal complications include cavernous sinus thrombosis, meningitis or brain abscess. If the cellulitis does not respond promptly to antibiotics, an orbital abscess may be present and require surgical drainage.

There are three orbital neoplasms of childhood whose most common and classic sign is proptosis: Neuroblastoma, rhabdomyosarcoma, and optic nerve glioma.[4] Neuroblastoma is the most common *metastatic* orbital tumor of childhood, and presents with an abrupt onset of proptosis and ecchymosis, often bilaterally. The metastases usually occur late in the disease when the primary tumor in the abdomen is easily detectable, but on occasion the ocular involvement may be the initial manifestation. As noted above, eyelid ecchymosis usually accompanies the orbital metastases and is caused by venous obstruction from micrometastases. Rhabdomyosarcoma is the most common *primary* tumor of the orbit in childhood, and usually develops in older children. Picasso's sign (Figs. 5 and 6) has been used to describe the displacement of the globe that rhabdomyosarcoma frequently produce. Primary orbital rhabdomyosarcoma patients have excellent long-term prognosis, with chemotherapy and radiation being the mainstays of therapy, though surgery may be considered in small, well encapsulated tumors. Unlike the two preceding tumors, optic nerve gliomas are rarely malignant. 50% of cases are associated with type 1 neurofibromatosis. Visual loss in conjunction with proptosis is common in these patients as the tumor arises directly from the optic nerve. Treatment, when needed, is surgical excision.

Figure 5.

Aniridia (Fig. 7)

The final ocular sign with potentially life-threatening implications is aniridia. Aniridia, or absence of the iris, is actually a misnomer since there is always some iris tissue present. The amount of iris present can vary widely, but all patients will appear to have abnormally large pupils which react poorly to light. The overall occurrence of aniridia is quite low with a prevalence of approximately 1 in 50,000. Of affected

Figure 6.

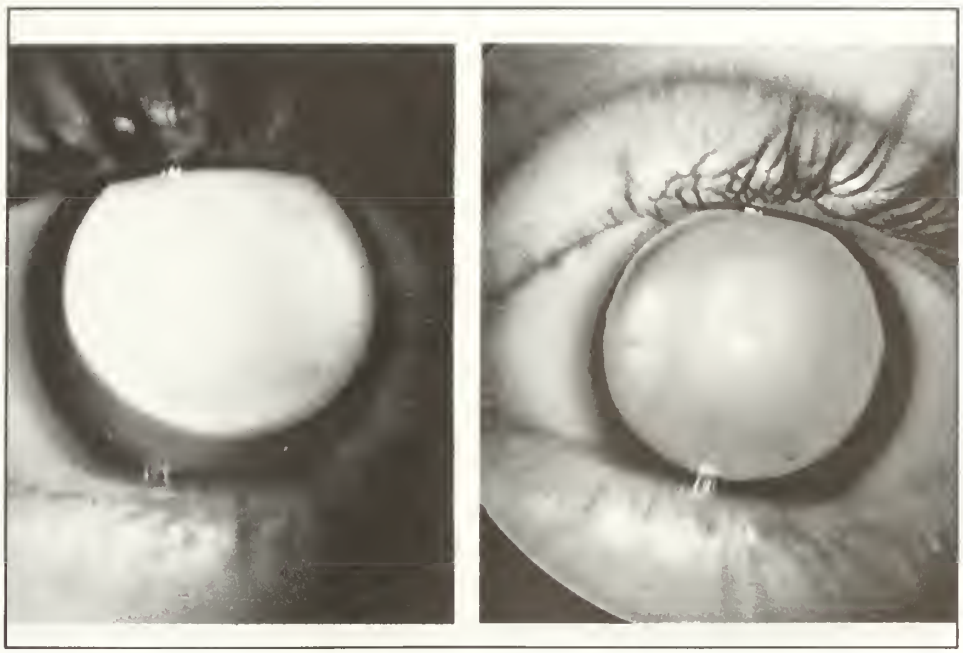

Figure 7.

patients two-thirds have affected parents, demonstrating autosomal dominant inheritance patterns with variable penetrance. It is the patients who lack a family history, patients with the sporadic form, whoch are at high risk for the development of Wilm's tumor,[6] a malignant teratoma of the kidney which may grow to enormous size. Approximately one-third of patients with sporadic aniridia will develop Wilm's tumor, almost always being diagnosed before age 5. One protocol calls for these children to have abdominal ultrasounds every three months until age 5, every six months until age 10, and yearly until age 16.

From the above it should be clear that ocular findings in chlidren may not only indicate disease of consequence to the eye but, at times, disease of life-threatening importance. Indeed, when any of the above signs are encountered it is the ophthalmologist who should be called upon to differentiate between eye signs of disorders benign or mortal.

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Ophthalmic Complications of Systemic Disease

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This paper highlights the complex interrelationships that exist between the eye and the rest of the body. A cursory review of the ocular and systemic manifestations of four interesting cases, which we have seen in the past twelve months, are presented. These cases stress the importance of a thorough ophthalmologic evaluation in patients with systemic diseases. References are listed for those readers interested in obtaining more information. The spectrum of ocular manifestations of systemic disorders is unlimited, and these four cases emphasize how complex and varied such changes are.

Case #1: Ocular Syphilis

We present a case of a 22-year-old, HIV-positive male who developed an acute bilateral anterior and posterior uveitis as the initial clue in the presentation of acquired syphilis.

A 22-year-old black male presented with a six-week history of blurred vision and a sensation of "a film" over his eyes, left eye greater than right. He had no complaints of redness, pain, photophobia or discharge nor was his past ocular history remarkable. His past medical history was significant for HIV infection acquired from homosexual intercourse with a positive partner six years ago. His last recorded T-helper count was 132. He had no previous history of opportunistic infection or sexually transmitted disease. Review of systems was significant for low grade temperature and malaise. Skin was remarkable for a groin "rash." Six months earlier he had been exposed to tuberculosis.

Ocular examination revealed a visual acuity of 20/200 in the right eye and 20/400 in the left eye. Intraocular pressures were within normal limits. External examination and extraocular motility were normal. Pupils were 4 mm in both eyes and sluggishly reactive to light. No afferent pupillary defect was noted. Near response was noted to be normal in both eyes. Slit lamp examination showed trace conjunctival injection. His cornea revealed diffuse, fine, keratic precipitates on the endothelium in the right eye and larger "mutton-fat" keratic precipitates in the left. Anterior chamber showed 1+ cells and flare in the right eye and 2+ cells/1+ flare in the left eye. There were no nodules on the irides. Dilated fundus exam showed vitreous haze, greater in the left eye. Optic discs and maculas were grossly normal. Diffuse white, focal choroidal lesions with perivascular sheathing were noted in the right eye (Figure 1). View of the fundus in his left eye was limited by the vitreous haze.

The spectrum of ocular manifestations of systemic disorders is unlimited, and these four cases emphasize how complex and varied such changes are.

Laboratory investigation revealed the following results: ESR 90mm/hr; WBC 4.6 (72% polys/2% bands/21% lymph); Hg 10.2/Hct 30.5; RPR 1:1 → 1:1024 (repeat); FTA-ABS (+). Serum IgG and IgM levels were elevated at 4040 and 889 mg/dl respectively; ACE level, Lyme titers, toxoplasmosis titers, blood cultures and chest x-ray were normal. PPD and anergy panel revealed an anergic response. Lumbar puncture was performed revealing an increased protein level of 83; normal glucose of 44; 2 RBC's/82 WBC's (2% polys/89% lymph/8% mono); CSF VDRL and RPR were (+); CSF fungal, virus, toxoplasma and India ink studies were negative.

General physical examination was remarkable only for a lichenified, intertriginous perineal rash consistent with tinea cruris. Skin exam was otherwise unremarkable. No inguinal adenopathy was noted.

The patient was admitted with the diagnosis of neurosyphilis and received IV penicillin G therapy of 3 million units every 4 hours and oral probenecid 500mg po 4 times a day. He received a total of 13 days of treatment before signing out of the hospital against medical advice. He also received topical prednisolone acetate 1% one drop in both eyes six times a day.

The patient kept one follow-up appointment two weeks after his hospitalization, and his visual acuity had improved (20/50 OD; 20/100 OS). Anterior chamber showed a trace of cells in both eyes (decreased from previous exam). Dilated fundus exam showed decreased vitreous haze and cells and fundus lesions as previously noted.

The patient was admitted two months later for an unrelated reason and repeat LP showed normalization of CSF protein to 37; glucose 60; 684 RBC's/7 WBC's (12% poly/78% lymph, 10% mono). Serum RPR 1:256; FTA-ABS (+).

Syphilis has once again been brought to the forefront of clinical medicine with the emergency of the HIV epidemic. Ocular

ABBREVIATIONS USED

ACE:	*Angiotensin converting enzyme*
CAR:	*Cancer-associated retinopathy (syndrome)*
CNS:	*Central nervous system*
CSF:	*Cerebrospinal fluid*
CT:	*Computerized tomography*
ESR:	*Erythrocyte sedimentation rate*
FTA-ABS:	*Flourescent Treponemal Antibody-Absorption*
GDP:	*Guanosine diphosphate*
GTP:	*Guanosine triphosphate*
Hg:	*Hemoglobin*
Hxt:	*Hematocrit*
HIV:	*Human immune deficiency (virus)*
IgG, IgM:	*Immunoglobulin G, immunoglobulin M*
IK:	*Interstitial keratitis*
KP:	*Keratic precipitates*
MRI:	*Magnetic resonance imaging*
MW:	*Molecular weight*
OD:	*Right eye*
OS:	*Left eye*
PPD:	*Purified protein derivative (tuberculin)*
RPR:	*Rapid Plasma Reagin*
UC:	*University of California*
WBC:	*White blood cell (count)*

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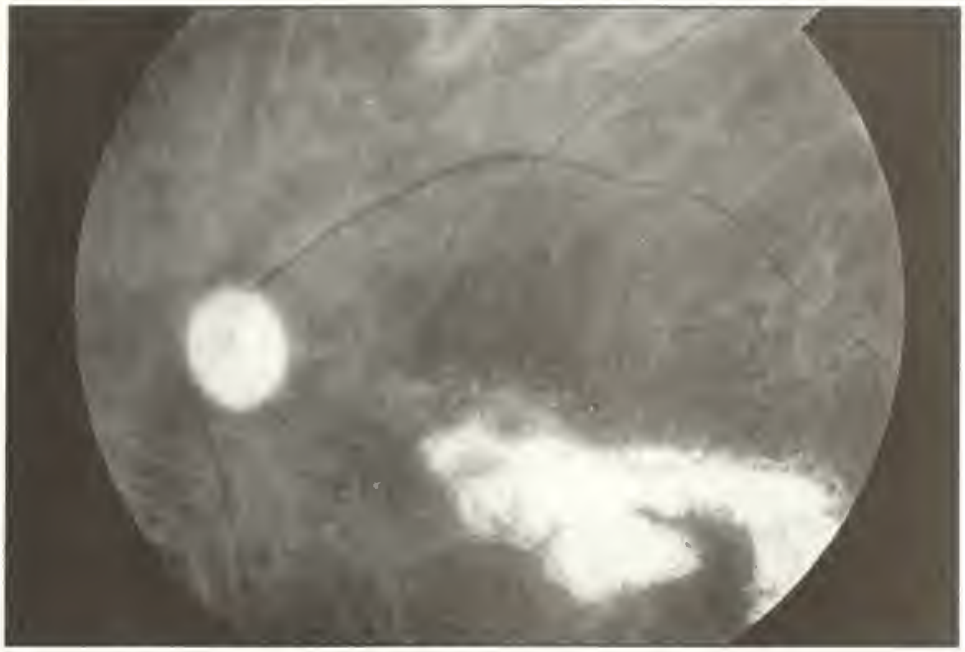

Figure 1. Fundoscopy of right eye, Case #1, showing choroidal lesions with perivascular sheathing.

disease may be the initial clue in the diagnosis of an otherwise occult, advanced form of systemic lues. As with the disease itself, the wide spectrum of ocular manifestations attributable to syphilitic disease reaffirms its designation as the "great imitator." Uveitis is the most common ophthalmic manifestation of syphilis, representing 1% of all cases.[3] In the secondary stage of the disease, this inflammation of the middle, vascular layer of the eye may affect both the anterior (iridocyclitis) as well as the posterior (chorioretinitis) uveal tract. In fact, up to 10% of cases with the constitutional symptoms, lymphadenopathy and mucocutaneous lesions typical of the secondary stage, will have uveitis predominantly, anterior iridocyclitis.[5]

Typical symptoms of syphilitic uveitis include variable levels of eye pain, photophobia, redness and decreased visual acuity. Examination may show conjunctival injection especially in the perilimbal area ("ciliary flush"). Large "mutton fat" keratic precipitates (KP) may be present on the posterior corneal endothelium representative of granulomatous inflammation though they may be smaller and non-granulomatous in nature. The anterior chamber examination shows cells, flare, and iris involvement which may include dilated capillary loops ("iris roseate"), sectorial iris atrophy, or granulomatous nodules (Busacca). Posterior uveitis denotes primary infection and inflammation of the choroid, with secondary involvement of the contiguous retina and vitreous (chorioretinitis/vitreitis). A view of the retina may be limited by vitreous inflammatory cells and debris. The fundus findings, as demonstrated in this case, include multifocal choroiditis (deep white/yellow subretinal focal lesions) and retinal vascular sheathing representing vasculitis of the retinal vessels (Figure 1).

Other posterior pole manifestations include papillitis, optic neuritis, macular edema, neuroretinitis, retinal detachment, choroidal effusions, acute retinal necrosis, central retinal vein occlusion, and subretinal neovascular membranes. Other less commonly described ophthalmic manifestations of syphilis disease include blepharitis, conjunctivitis, eyelid and conjunctival gummas (tertiary stage), scleritis, and episcleritis. Secondary cataracts or glaucoma (open or closed angle) may develop from chronic inflammation.

Classically, corneal involvement in the form of bilateral interstitial keratitis develops between the first and second decades of life from congenital infection. Although it may be unilateral in 25% of congenital disease, 10% of interstitial keratitis (IK) is acquired.[1] Chronically, sequelae of IK include corneal ghost vessels and corneal stromal scarring. This may lead to chronically decreased vision that may be amenable to corneal transplantation in select cases. Neuro-ophthalmologic manifestations reflect CNS involvement in tertiary disease. The well-described Argyll Robertson pupil is characteristic, but not diagnostic of syphilis, since it has also been described with alcoholism, multiple sclerosis, and diabetes.[1] Otherwise known as a "prostitute's pupil", the iris shows pupillary constriction with the near response but is non-reactive to light (light-near dissociation), presumably secondary to an interruption of the neural connection between the Edinger-Westphal and pretectal nuclei.[1] Other signs of tertiary disease including oculomotor nerve palsies, visual field deficits, gaze palsies, and internuclear ophthalmoplegia, can be secondary to focal CNS gummas.

Diagnosis is based primarily on non-treponemal (VDRL, RPR) and treponemal serologic testing and on differentiating syphilis from other causes of granulomatous uveitis (e.g., tuberculosis, sarcoidosis, Lyme disease). RPR/VDRL titers, though less sensitive than treponemal tests (70% vs. 98% sensitivity in tertiary disease), can be used as a monitor of disease activity and treatment efficacy.[2] Fluid contained within cutaneous lesions may be examined for spirochetes by darkfield microscopy or direct fluorescent antibody microscopy. Tissue sections can be stained for treponemes using Warthin-Starry or silver stains. CSF analysis for neurosyphilis may show increased protein, pleocytosis and lymphocytosis. CSF RPR/VDRL shows a high rate of false negatives in ther ange of 19 to 50%, and is most useful as a monitor of treatment.[1] Treponemal tests, on the other hand, are more sensitive for a diagnosis of CNS infection and a negative CSF FTA/ABS can essentially rule out neurosyphilis.

Special considerations, however, must be given in the case of co-infection with both HIV and *T. pallidum.* First, perhaps because of the general depression of both humoral and cellular immunity, the sensitivities of both treponemal and non-trenponemal tests are diminished with a reported FTA-ABS sensitivity of only 62% in HIV infection.[1] As a result, obtaining both the diagnosis and following the course of the disease becomes more difficult. Secondly, syphilitic infection in HIV-positive individuals tends to follow a more aggressive course, and is more resistant to treatment.

Treatment for ocular syphilis is based on the stage of the disease. Primary and secondary disease may be treated with IM penicillin G or doxycycline for penicillin-allergic patients. CNS involvement requires IV therapy of penicillin G 2 to 5 million U every four hours for a total of 10-14 days. An alternative regimen is procaine penicillin G 2.4 million UIM daily plus probenecid 500 mg four times a day for 10-14 days.[1] There is no alternative treatment for penicillin-allergic individuals with tertiary disease. In this situation, experts suggest desensitizing the patient and subsequently treating with penicillin in CNS dosages.[3] After initiation of antimicrobial therapy, topical steroids, tapered to clinical response,

and cycloplegics should be initiated to limit the potential damage caused by ongoing ocular inflammation.

Controversy does exist, however, in some aspects of therapy. Some physicians feel that all patients with ocular disease should be treated with neurosyphilis dosages, especially if there is evidence of posterior uveitis or optic nerve involvement. Most agree that lumbar puncture is warranted to rule out CNS involvement when ocular involvement is evident.

Case #2: Fibrous Dysplasia and McCune-Albright Syndrome

Systemic diseases of bone that affect the craniofacial skeleton and result in visual morbidity are rare entities. An awareness of these conditions is necessary for institution of early intervention and minimization of visual loss. Fibrous dysplasia and a syndrome that also manifests this disorder, the McCune-Albright syndrome, are examples of benign processes that can result in devastating loss of vision at an early age. These disorders almost always require a multi-team approach for management of the ophthalmic, systemic, and cosmetic complications.

A twenty-four year old male presented for evaluation of progressively decreasing vision in the left eye for three months. He also noted an irregular bulge of the left side of his forehead for approximately one year. He had no significant past medical history, including no history of bony fractures or endocrine abnormalities.

Ophthalmologic evaluation revealed a best corrected visual acuity of 20/20 in the right eye and 20/30 in the left eye. The external exam revealed an irregular contour of the left forehead. The globe appeared to be slightly depressed and proptotic. The proptosis was confirmed by exophthalmometry measurements. Pupillary exam revealed a Marcus Gunn afferent defect in the left eye. Color desaturation was apparent in the left eye as well. The slit lamp examination was within normal limits. The dilated fundus exam was unremarkable on the right side; however the left optic nerve was pale. Visual field testing identified a superior temporal and an inferior temporal defect in the left eye. MRI of the brain revealed a diffuse calvarial process involving the left frontal bone and left orbit, extending into the lesser and greater wing of the sphenoid (Figure 2).

Fibrous dysplasia is a benign, slowly progressive disorder of bone of unknown etiology. Although it comprises 2.5% of all bony tumors, estimates of the frequency of fibrous dysplasia of the craniofacial bones vary from "rare" (5/7,446 cases of orbital tumors at the Mayo Clinic over 26 years) to not uncommon.[6] According to one study, 20% of patients with fibrous dysplasia have craniofacial involvement, which tends to be unilateral and occurs more frequently in the polyostotic variant as described below.[11]

There are two clinical classifications of

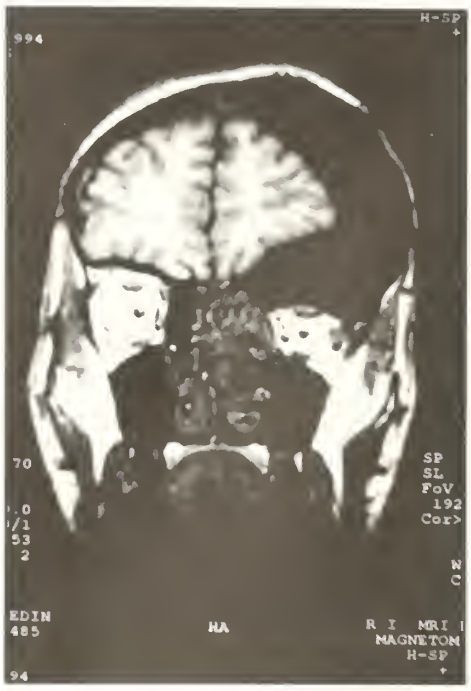

Figure 2. MRI of brain, case #2, showing bony changes in left frontal and orbital bones with extension to the sphenoid.

this disorder, and they are based on the extent of body skeleton involvement. The monostotic form is the most common, where only one or several contiguous bones are involved, this form, most often diagnosed between 20 and 30 years of age, tends to become quiescent around the time of puberty and worsen during pregnancy. Monostotic lesions tend to involve the ribs, femur, tibiae, cranium, maxillae, and mandible. Of the cranial bones, the frontal and sphenoidal bones are most commonly involved. The second type is the polyostotic variant, where several distinct areas of the skeleton are affected. Approximately a quarter of these individuals have more than half of the skeleton involved. Most cases are detected in childhood as a result of fractures and skeletal deformities. Unique to the polyostotic variant are *cafe-au-lait* skin lesions in one-third of patients. These tend to occur ipsilateral to the site of bone involvement and are histologically distinguishable from similar skin changes seen in Von Recklinghausen's disease.[8] The polyostotic variant is more severe and deforming with earlier clinical onset.

Ocular morbidity is seen in both monostotic and polyostotic fibrous dysplasia and is related to the particular bone involved in the dysplastic process. Involvement of the frontal bone can lead to proptosis. Lesions at the base of the skull can lead to extraocular muscle palsies and trigeminal neuralgia. Involvement of the sphenoid bones can lead to compression of the optic nerve with optic atrophy and loss of vision. Larger lesions can even involve the optic chiasm. Maxillary dysplasia can lead to epiphora by involving the naso-lacrimal system. Additionally, secondary complications can arise from malignant transformation, ossifying fibroma formation, and development of a mucocele.[6] Mucoceles occurring in the sphenoid bone can cause compression of the optic nerve, leading to visual loss. Malignant change is an uncommon complication, occurring in less than 1% of cases; in one-third of these cases there is a history of radiation treatment.

The histology of fibrous dysplasia reflects the benign process. The marrow cavity is shown to be filled with benign-appearing fibroblastic tissue arranged in a loose, whorled pattern. The bone spicules are poorly formed, lacking palisading or rimming. The architecture of the trabeculae is also irregular, contributing to the weakness of the bone and propensity for fractures.

The radiographic features are also characteristic and reflect the above histology. The CT scan shows the irregular internal structure of the dysplastic bone, with mixed areas of ossified and unossified fibrous tissue and cystic cavities. These "cysts", however, are actually solid fibro-osseous masses and not cavities. The bone is also larger than normal, and this is due to diffusely marked sclerosis with thickening of the involved bone. The thickening can result in decreased size of the orbit and sinuses. Thus the "small orbit sign" is said to be useful in the radiographic differential diagnosis between supraorbital fibrous dysplastic and meningioma.[14] The short stature seen in young patients is believed to be due to the premature closure of the epiphyses.

When the above findings of fibrous dysplasia are seen in a young patient, particularly a female, with *cafe au lait* spots and precocious puberty, one must think of the McCune-Albright syndrome. This unusual syndrome has the triad of bone, skin, and endocrine abnormalities. Much has been learned in the last five years about the hyperfunction of multiple endocrine tissues in these patients. The documented potential of endocrine anomalies include not only gonadotropin-independent precocious puberty but also hyperthyroidism, hypercortisolism, an excess of growth hormone, and hypophosphatemia. All these forms of glandular hyperfunction have in common the involvement of cells that respond to extra-cellular signals through the activation of the hormone-sensitive adenylate cyclase system, the membrane-bound enzyme that catalyzes the formation of the intracellular second messenger cyclic AMP. Further-

more, for each condition, there is *no* associated serum elevation of the respective stimulatory or tropic hormone. Hence, the nature of the glandular overactivity is intrinsic (i.e., non-ligand-dependent activation). It stands to reason, then, that the etiology of the multiple endocrine hyperactivity should be a defect that causes constitutive activation of the adenylate cyclase system.

In 1991 Weinstein *et al* elucidated the molecular basis of the McCune-Albright syndrome.[12] Within the adenylate cyclase system there is a Gs Alpha protein which stimulates adenylate cyclase activity and thereby increases the synthesis of cyclic AMP, leading to a biochemical chain that results in the physiologic response of the gland. The break up of the Gs Alpha protein, facilitated by hydrolysis of GTP to GDP, breaks the chain reaction. Weinstein *et al* described an activating mutation of the Gs Alpha gene in patients with the McCune-Albright syndrome. The mutation resulted in the replacement of arginine by either histidine or cysteine at position 201 of Gs Alpha. This manifested in a Gs Alpha protein with reduced GTPase activity, leading to autonomous hyperfunction. The affected endocrine tissues contained both normal and abnormal regions, confirming that the disorder is probably due to an early postzygomatic somatic mutation that results in mosaicism. Whether this mutation results in dysplastic bone as well is unclear since attempts to find the defective protein in bone were not successful.

The cornerstone of treatment of these disorders is early recognition by the primary care physician and knowledge of its complications. This is particularly true, for example, for ophthalmic management since visual loss can be insidious and missed if tested only by screening exams. With optic nerve compromise from dysplastic bone, a patient can have profound peripheral field loss leading to legal blindness despite 20/20 central visual acuity.

Case #3: Neurocysticercosis

A 13-year old Mexican girl, who recently entered the U.S., presented with a six-month history of generalized seizures occurring several times per week. She described an aura of occipital headache, dizziness, and "seeing lights" associated with jerking movements of all four extremities for approximately five minutes, followed by a period of fatigue and headache. She then had daily headaches associated with nausea and vomiting, frequent staring spells, and occasional episodes of right-sided numbness and ataxia. Family history was positive only for migraine.

The patient was of normal stature, afebrile and normotensive. Although her eyes were proptotic, her pupil and extraocular muscle motility were normal. On fundus exam marked papilledema was evident (Figure 3). Neurological and physical exam was otherwise normal.

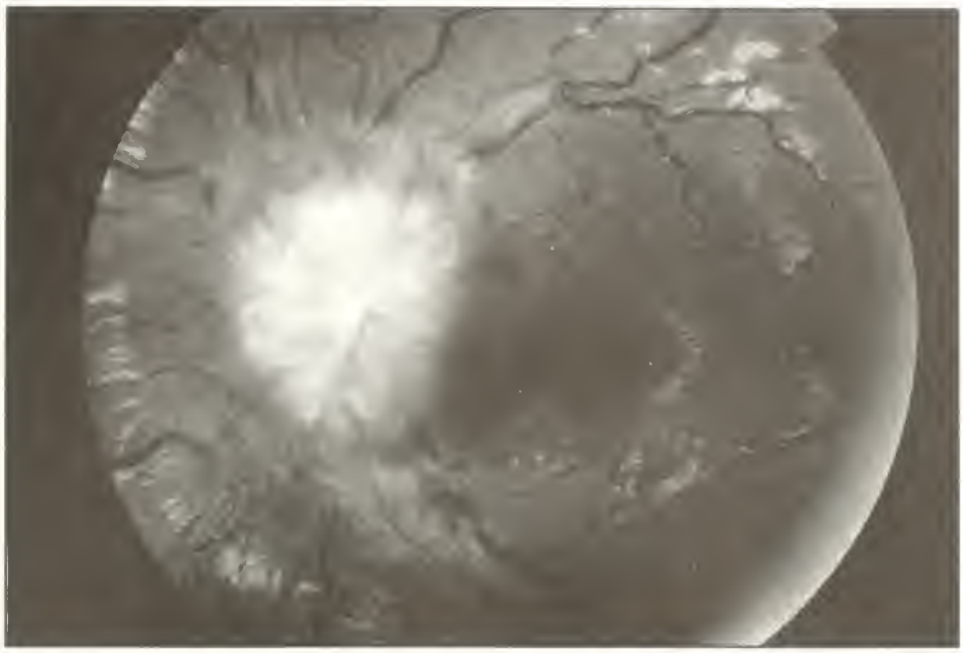

Figure 3. Fundoscopy, case #3, showing marked papilledema.

Initial lab results revealed: WBC 7.6×10^9. ESR was 13 mmh/h. Urinalysis and stool were negative for ova and parasites. A lumbar puncture was deferred. Because of the papilledema, the patient was sent for an emergent CT of the head without contrast which revealed multiple punctate calcifications consistent with a diagnosis of central nervous system cysticercosis. Serology was strongly positive at 1:1,024.

The patient was admitted and treated with praziquantel (50 mg/kg/d), prednisone (40 mg/d) and valproic acid (15 mg/kg/d) for a 14-day course. Eight months after her initial presentation, her seizures were well-controlled on valproic acid and dilantin, and repeat CT scan revealed a decrease in the number of cysts.

Neurocysticercosis is the most common parasite disease of the CNS in the United States.[15] It is extremely prevalent in Latin America and is a common cause of seizures and hydrocephalus. Most cases in the United States are recent immigrants from endemic areas. Infection occurs when the ova of *Taenia solium* (the pork tape worm) are ingested by the fecal-oral route or in contaminated food or water. After ingestion, the eggs hatch forming oncospheres which migrate through the intestinal walls. They enter the vascular and lymphatic systems and disseminate. Cysticerci (oncospheres which develop fluid-filled bladders) can form in any tissue of the body. However, ocular, muscular, and cerebral involvement is more symptomatic and therefore more commonly reported.[16]

The most common presentation of neurocysticercosis is seizures; however, 50% of EEG's are normal. Diagnosis may be made clinically, radiographically (MRI or CT) or serologically.[17] Enzyme-linked immunoelectrotransfer blot assay is the most specific and sensitive test.[18] Stool is often negative for ova and parasites at the time of presentation. Praziquantel 50 mg/kg/d for 3-4 weeks is recommended for patients with seizures or multiple viable cysts. Occasionally, cysts are surgically resected.

The papilledema is secondary to obstruction of axoplasmic transport. The optic nerve transports material between the retinal ganglion cells and the lateral geniculate body in a back and forth direction. When increased, intracranial pressure causes a decrease in this axoplasmic transport and swelling of the optic discs results.

Episodes of transient visual loss, headaches, nausea or vomiting are often associated with increased intracranial pressure. The etiology of papilledema is extensive and includes intracranial tumors, meningitis, encephalitis, subdural and epidural hematomas, and pseudotumor cerebri. CT scan or MRI of the head and orbit along with lumbar puncture are often indicated.

We believe that both mechanical and vascular factors secondary to the cysticercosis cysts produced a blockage of axoplasmic flow in the optic nerve of this patient.

Case #4: Paraneoplastic Retinopathy

Paraneoplastic syndromes are defined as remote, or secondary, effects of cancer that become manifest in the absence of metastases. The effects have been attributed to hormones, antibodies, and/or toxins produced in the presence of certain

Figure 4. Fundoscopy, case #4, showing scattered yellow-white patches,some hemorrhagic.

neoplasms. A variety of paraneoplastic phenomena causing visual loss have been described. These include cancer-associated retinopathy, or the CAR syndrome, diffuse uveal melanocytic proliferation, and optic neuropathy. We recently evaluated a patient who demonstrated the CAR syndrome, most likely due to an autoimmune mechanism.

A 53-year old male presented to a local hospital with ataxia. CT scan revealed a right parieto-occipital mass. He subsequently underwent craniotomy revealing a poorly-differentiated adenocarcinoma of unknown primary site. Two weeks after the biopsy, the patient developed increasing confusion, weakness, and worsening vision. Ophthalmologic exam revealed no light perception. His pupils were unreactive and extraocular movements were full. Anterior segment exam was grossly normal. On fundus exam, there was optic nerve pallor and marked narrowing of the retinal vessels. In addition, numerous yellow-white patches, some associated with hemorrhage, were located throughout the retina (Figure 4). These lesions appeared either in or under the retina.

Repeat CT scan of the brain was unchanged and spinal fluid cytology was negative. Electroretinogram showed extinguished photopic and scotopic responses. Despite a course of intravenous corticosteroid and immunoglobulin, his vision failed to return. His condition rapidly deteriorated, and he died two months later. Post-mortem exam was refused.

Samples of the patient's serum and cerebrospinal fluid were sent to Dr. Charles Thirkill at UC-Davis Medical Center. The CSF contained titers to the CAR antigen that were the highest ever recorded by him.

Cancer-associated retinopathy is defined as visual loss secondary to retinal degeneration associated with cancer. First postulated in 1976,[19] this syndrome has been reported most frequently in association with small cell carcinoma of the lung, but also has been noted less often with undifferentiated cervical, breast and endometrial carcinoma as well as non-small cell carcinoma of the lung. Patients usually present with visual symptoms that pre-date the diagnosis of cancer.

Patients with the CAR syndrome often present with numerous visual phenomena and complaints which usually precede the finding of decreased visual acuity. The patients have an insidious loss of vision over several months. There may be decreased color vision and a variety of visual field defects. Anterior chamber cells may be present. Funduscopic exam often demonstrates vitreous cells, retinal arteriolar narrowing, changes in the retinal pigment epithelium and less, commonly, optic nerve pallor. Electrophysiologic testing utilizing electroretinography shows markedly diminished scotopic and photopic recordings.

Histologic findings, only noted in a few cases, showed near total loss of the inner and outer segments of the photoreceptors and the outer nuclear layer.[20] Some reports revealed extensive loss of ganglion cells and atrophy of the nerve fiber layer.[21] The choroid was intact in almost all cases.

Two mechanisms have been postulated to explain the CAR syndrome. One involves an autoimmune process, in which antibodies made by the host in response to specific tumor antigens cross-react with certain retinal proteins. The second involves humoral agents or toxins, secreted by the tumor, which in some way interfere with retinal functioning. The mechanism in the latter possibly involves direct effects on the retinal pigment epithelium, thereby disrupting the physiologic interaction between the RPE and photoreceptors. This disruption results in the loss of the outer retinal layers.

In the autoimmune model, Keltner and associates,[22] utilizing serum from a patient with undifferentiated carcinoma of the cervix and whose retina showed outer layer atrophy, found complement-fixing antibody to photoreceptors of normal retinal tissue. Further studies on this patient and three others with small cell lung cancer revealed similar results. The four serum samples then underwent western blot analysis, and all four bound retinal antigens of approximately 23,000 daltons (23kd). One sample also reacted with an antigen of approximately 48 kd, the zone of the retinal S-antigen, the group called the 23kd antigen the "cancer-associated retinopathy" antigen. They hypothesized that the antibody to this may have a relationship to visual loss since it was not present in normal subjects or in cancer patients without visual symptoms.

Kornguth et al,[23] in 1982, studied serum from patients with small cell lung cancer and visual loss. They noticed an intense reaction to the large cell bodies of the ganglion cells of the retina. The serum of these patients bound to antigens of MW 205kd, 145kd, 65kd, and 20kd. The patients' serum also reacted with the same mw proteins when tested against other small cell carcinoma lines. Thus, they hypothesized that the basis for the retinal change is a cross-reacting antibody to the small cell tumor and normal retinal tissue. As further evidence of autoimmune etiology, these patients had a high level of immunoglobulin in their CSF as well as immune deposits on both the retina and tumor of these patients.

Thirkill et al[24] in 1989 described a patient with small cell carcinoma. Studies revealed antibodies to retinal, optic nerve, and small cell carcinoma antigens. There was a strong reaction to the 23kd retinal antigen and a 65kd lung antigen. In this study, immunohistochemical studies of the patients' serum against rhesus monkey retina showed heavy labeling of the three retinal nuclear layers, the nuclei of the retinal pigment epithelium, and the large choroidal vessels. The patients' serum also bound to small cell carcinoma nuclei.

The aforementioned studies all support an autoimmune basis for the CAR syndrome. The patient described likely represented a rare form of this syndrome, in that his visual loss was extremely rapid and adenocarcinoma of unknown primary was the underlying malignancy. Factors supporting this diagnosis include profound bilateral visual loss, fundus findings of optic nerve pallor and retinal arteriolar attenuation, markedly extinguished photopic and

scotopic electroretinography, and very high CSF titers of antibodies to the CAR antigen. An argument could be made that his visual loss could have had a contribution from occipital disease. Also, his mental status precluded an exact timing and characterization of his visual symptoms. In addition we cannot explain the whitish-yellow retinal or sub-retinal lesions in the setting of presumed paraneoplastic retinopathy.

Paraneoplastic retinopathy is a rare entity which can cause visual loss. Since the ocular changes often manifest prior to a systemic diagnosis of malignancy, a suspicion of this diagnosis by the ophthalmologist could direct the medical team towards an appropriate systemic work-up to explain the visual symptoms.

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Ocular Disorders in Women

Francis X. Figueroa, MD
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Ocular signs and symptoms are the first manifestation of many systemic diseases and a complete ocular examination by an ophthalmologist may be critical in early diagnosis. Proper eye care is essential in many chronic diseases to prevent sequelea leading to decreased vision. This paper is a review of the ocular manifestations of some diseases which occur more commonly in women, ocular changes and abnormalities exacerbated by pregnancy, and the use of ocular medications during pregnancy.

Systemic Diseases Common in Women

Graves' disease acocunts for more than 85% of hyperthyroidism and affects as many as 2% of the female population. Although the precise etiology is still not known, it is believed to be an autoimmune disorder where non-TSH thyroid antibodies circulate. Systemic signs and symptoms of hyperthyroidism are well described and include fatigue, weight loss, emotional liability, heat intolerance and palpitations. Thyroid eye disease may be an isolated finding, or it may precede, develop with, or follow the onset of hyperthyroidism.[1]

Eyelid retraction is the most consistent clinical feature of thyroid ophthalmopathy which may lead to dry eyes and corneal exposure due to lagophthalmos. Patients often complain of photophobia, irritation, and a gritty sensation in the eyes. Aggressive topical lubrication may be necessary for corneal protection and in more severe cases, punctal occlusion or temporary tarsorrhaphy (surgically joining the upper and lower eyelids) may be required to maintain corneal integrity especially during the acute phase.

Among the ocular findings in Graves' disease, the most striking is exophthalmus, secondary to lymphatic infiltration and enlargement of the extraocular muscles and the comparison of venous and lymphatic vessels within the bony confines of the orbit. Diplopia occurs when the swollen extraocular muscles can no longer function properly. The most frequently involved muscle is the inferior rectus; therefore, inability to elevate the eye is frequently encountered. Any extraocular muscle may be involved causing a variety of ocular motility disturbances. Prisms are used to evaluate the extent of imbalance and can be incorporated into spectacle lenses to alleviate diplopia. During active orbital inflammation, high dose steroids (prednisone 100 mg daily), or immunosuppressive agents may limit muscle damage and decrease orbital edema.

The effects of pregnancy on the eye are numerous and may lead to specific pathologic conditions or may exacerbate pre-existing ocular diseases.

Visual loss in thyroid eye disease is usually due to optic neuropathy. This results from compression of the optic nerve secondary to muscle enlargement at the orbital apex. High dose steroids and orbital decompression surgery may be ncessary to preserve the optic nerve. This often entails removing the media orbital wall to allow expansion of orbital contents. When orbital findings stabilize, a variety of procedures can be offered to improve lid closure and reduce corneal exposure, giving a more normal appearance to the patient. These include eyelid recession, implantation of weighted gold pellets to the upper eyelid as well as orbital decompression (Figure 1). Extraocular motility surgery can also be offered.

Sjögren's syndrome, an immunologic disorder predominantly affecting women in the third or fourth decade of life, is the second most common rheumatologic disease in the United States. It is characterized by progressive destruction of the exocrine glands by lymphocytic infiltration and immune-complex deposition. The disease frequently manifests itself initially with ocular symptoms, since 90% of all patients with Sjögren's have keratoconjunctivitis sicca (dry eye) secondary to lacrimal gland infiltration. Virtually any organ system of the body may be affected leading to xerostomia (dry mouth), chronic thyroiditis, cirrhosis, vasculitis, or nephritis. Diagnosis is verified when the triad of keratoconjunctivitis sicca, xerostomia and mono-nuclear infiltration of the salivary gland by biopsy is found. Although there is currently no effective treatment for the ongoing exocrine gland destruction, effort is aimed at symptomatic relief and limiting the damaging local effects of chronic xerophthalmia and xerostomia. Methylcellulose eye drops are the visual first line of treatment but many other options can be offered including longer-acting lubrication inserts, temporary or permanent punctal occlusion and soft contact lens therapy.

Nearly 90% of patients with *Systemic Lupus Erythematosus (SLE)* are young to middle-aged women. The problems that SLE patients encounter are due to either a small vessel vasculitis causing renal, mucocutaneous, and possibly nervous system involvement or a polyserositis causing joint, peritoneal, and pleuropericardial symptoms. Retinal vascular manifestations are the most

ABBREVIATIONS USED
DNA: Deoxyribose nucleic acid
SLE: Systemic lupus erythematosis
TSH: Thyroid stimulating hormone

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A

Figure 1. Pre- and post-operative photographs (A, B) of patients who underwent orbital decompression surgery for thyroid ophthalmolopathy. (Photographs courtesy of R. Jeffrey Hoffman, MD)

B

common form of ophthalmic involvement in patients with SLE and consist of occlusive microvasculitis with cotton wool spots (white areas of retinal ischemia), intraretinal hemorrhages, microaneurysms and Roth spots (Figure 2). These findings can be found in the absence of systemic hypertension and can reflect an underlying anemia. They generally improve when the disease is in remission. Branch retinal artery occlusions, however, can leave permanent scotomas in the patient's central visual field. Similarly, closure of the paramacular capillaries can cause decreased vision from chronic macular ischemia and edema. In such cases, the patient may complain of distorted vision.

Scleritis is a common manifestation of SLE and may be the presenting feature (Figure 3). It generally takes the form of diffuse anterior or nodular scleritis, and although it may be severe, it is very responsive to systemic steroids and scleromalacia is rare. Neuroophthalmic manifestations of SLE are common.[2] Cranial nerve palsies which may cause ocular motility deficits and lupus optic neuropathy may occur and are presumed secondary to either demyelination or axonal destruction. Involvement of the optic nerve often presents itself as an acute decrease in vision with pain on eye movement, difficulty discerning colors and afferent pupillary defect. Secondary Sjögren's syndrome and involvement of the eyelid with cutaneous disease are also common.

Metastic carcinoma of the eye is one of the most unfortunate diagnoses an ophthalmologist can make. Carcinoma of the breast is the primary lesion that most often metastasizes to ocular tissues.[3] Approximately one-fourth of patients who present to the ophthalmologist have no previous history of cancer. The posterior choroid, with its rich blood supply, is the most common site of intraocular metastatis and usually appears as a yellow, elevated mass on dilated retinal exam (Figure 4). Although not as common, metastasis may involve the iris or ciliary body as gray-white gelatinous nodules (Figure 5). The management of metastatic tumors of the uvea is generally external beam irradiation.

Pregnancy and The Eye

The effects of pregnancy on the eye are numerous and may lead to specific pathological conditions or may exacerbate pre-existing ocular diseases.[4] Hypertensive disorders in pregnancy and the progression of diabetic retinopathy may lead to decreased vision during pregnancy or the postpartum interval. Retinal changes are thought to be a reflection of placental blood supply and may also help in assessing the well-being of the fetus.

Normal physiological changes during pregnancy may cause visual disturbances. Increased corneal thickness secondary to edema is common in pregnancy and often causes changes in refraction. Contact lens wear may become difficult because of corneal edema or alteration in tear composition. Accommodative power may also diminish during pregnancy leading to difficulty in near vision. Therefore, it is recommended to wait several weeks postpartum before offering a new lens prescription.[5]

Diabetes mellitus. The effect of pregnancy on a diabetic woman's eye depends to a great extent on the status of her retinopathy at the start of the pregnancy. There is general agreement that blood glucose control throughout pregnancy is important for maternal and fetal well-being as well as stabilizing diabetic retinopathy. Women with gestational diabetes are at minimal risk for retinopathy. Approximately 12% of pregnant women with known diabetes and no retinopathy will develop some background diabetic retinopathy during pregnancy and greater than 50% of these will show regression postpartum with the vast majority suffering no visual impairment. Up to 47% of patients with background diabetic retinopathy at the start of pregnancy will have worsening of the retinopathy, usually during the second trimester which will usually improve postpartum. Five percent of these patients, however, will progress to proliferative retinopathy.

Forty-six percent of women with proliferative retinopathy at the beginning of pregnancy have progressive retinopathy and early laser treatment is generally advised to decrease the risk of visual loss from compli-

Figure 2. Retinal photograph showing occlusive retinal microvasculitis secondary to systemic lupus erythematosus. Note occluded retinal arterioles, macular edema and confluent cotton wool spots. A large retinal hemorrhage is also present.

cations such as vitreous hemorrhage or retinal detachment. The response of a pregnant diabetic's eye to laser photocoagulation appears to be no different from the response of a nonpregnant diabetic's eye. It should be noted that there has never been a documented case of progressive retinopathy in a patient with complete spontaneous or laser-induced regression of proliferative retinopathy at the beginning of pregnancy. Subsequent pregnancies in patients who have been treated and show complete regression of their retinopathy prepartum are therefore of little visual risk, even if they had progression during their previous pregnancy.

A pregnant woman with active retinal neovascularization is also at a greater risk for vitreous hemorrhage during spontaneous delivery, further supporting the benefit of early treatment. The potential progression of retinopathy warrants careful evaluation of the pregnant woman's eyes. All pregnant diabetics should have a baseline ophthalmologic exam in the first trimester with further follow-up at least once per trimester as indicated.

Eclampsia and preeclampsia. Visual disturbances including diplopia, scotomata, and dimness of vision are seen in nearly half of eclamptic patients and 25% of patients with severe preeclampsia and hypertension.

The earliest and most frequent retinal finding in preeclampsia is the development of segmental arteriolar spasm which is usually reversible. Hemorrhages, exudate, macular edema, and papilledema may also appear and often reflect the severity of the preeclampsia and level of blood pressure.

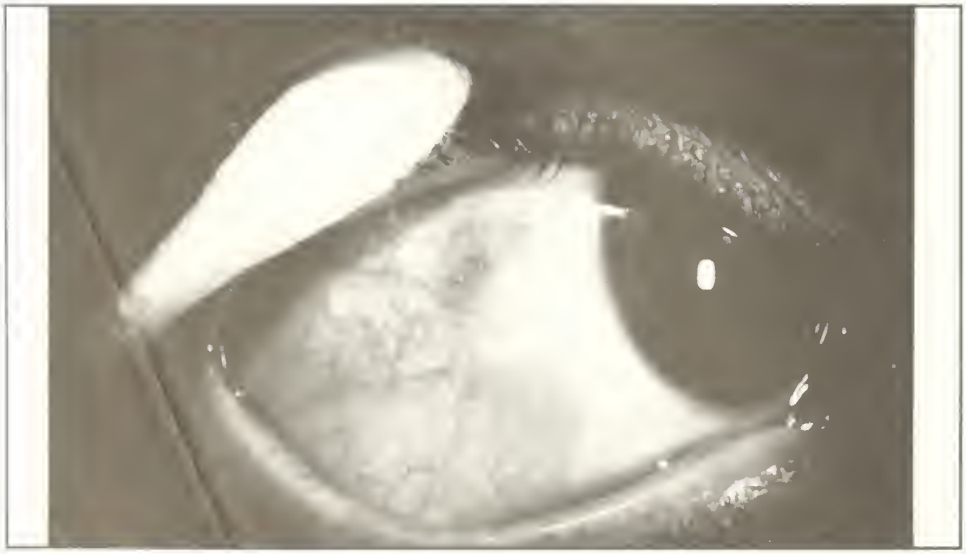

Figure 3. Photograph of diffuse scleritis.

Serous exudative retinal detachment has been reported to occur in 10% of patients with eclmpasia and in 1-2% of patients with severe preeclampsia. The detachments are presumed secondary to ischemia of the choroid and most patients have full resolution, although retinal pigmentary changes and decrease in vision may remain.

Ocular Medications During Pregnancy

The treatment of most common ocular disorders during pregnancy can be a challenge since few human studies explore the safety of ocular medications during pregnancy. The National Registry of Drug-Induced Ocular Side Effects provides some information. Of the many general ocular disorders needing therapy during pregnancy, some of the more common are glaucoma, infection, and uveitis.

Beta-adrenergic antagonist drops are often the first-line therapy in the treatment of primary open-angle glaucoma. These agents lower intraocular pressure by reducing aqueous humor production. Timolol maleate (Timoptic) is a mixed beta-1/beta-2 antagonist. Betaxolol (Betoptic) is a beta-1 antagonist and has the advantage of being pulmonary-sparing, making it possible to use in patients with coexisting bronchoconstrictive disease. There have been no reported cases of teratogenicity, but these medications are secreted in breast milk and should be used with caution in nursing mothers.

Carbonic anhydrase inhibitors such as acetazolamide (Diamox) and methazolamide (Neptazane) tablets also lower intraocular pressure by reducing aqueous humor production. Fifty percent of patients are intolerant of their side effects which include numbness and tingling of the extremities and lips, nausea, weight loss, depression, and nephrolithiasis. They have been associated with teratogenic effects, and their use is not advised during pregnancy.

Echothiophate iodide (phospholine iodide), a cholinesterase inhibitor used for glaucoma, may be transmitted through the placenta and breast milk, and therefore may suppress the infant's pseudocholinesterase level. It should be used only if clearly needed. No teratogenicity has been documented. There have been no studies conducted on the use of topical epinephrine in pregnancy; however, there is one report of congenital cataract in offspring of an animal receiving epinephrine. Similarly, there have been no studies on the use of pilocarpine (a direct-acting cholinergic) in pregnancy, and it is unknown if it is secreted in breast milk.

Figure 4. Right eye retinal photograph of patient with breast cancer with choroidal metastasis to both eyes. Note elevated, light colored lesions temporally and inferiorly. Vision was confined to hand motions. The patient later underwent proton beam irradiation.

Ocular Infections. Ciprofloxacin (Ciloxan) is a fluoroquinolone antibacterial agent with broad spectrum activity used for corneal infections. The anti-bacterial action of the quinolones results from interference with the eynzyme DNA gyrase which is needed for the synthesis of bacterial DNA. Although there are no adequate or well-controlled studies in pregnant women, caution should be exercised when Ciloxan is administered to pregnant or nursing women because of its method of action.

Gentamicin sulfate has been shown to depress body weights, kidney weights, and glomerular counts in infant rats when used in doses 500 times recommended in ophthalmic human doses. There have been no well-controlled studies on pregnant women.

Kernicterus may occur in the newborn following oral sulfonamides during pregnancy or in nursing methods. There are no controlled studies or reported cases when using topical sulfonamide preparations. Trimethoprim sulfate and polymyxin beta-blocker sulfate solutions (Polytrim) should be used with caution as trimethoprim may interfere with folic acid metabolism and has been shown to be teratogenic in rats at 40 times human doses and rabbits at six times human doses. There are no reports on the use of neomycin sulfate-polymyxin B sulfate compounds in pregnancy.

Medications such as tetracycline, antiviral agents for herpes simplex and pyrimethamine (Daraprim) used in the treatment of toxoplasmosis, have well-known teratogenic potential and should not be given during pregnancy.

For simple conjunctivitis during pregnancy, many patients can be treated conservatively with lid hygiene, warm compresses, and artificial tear drops to flush the eyes. Most conjunctivitis is self-limiting and resolves with pharmacologic intervention. Topical sulfonamides and neomycin-polymyxin B sulfate compounds are probably the safest topical ophthalmologic antibacterial preparations to use during pregnancy.

Uveitis

When treatting uveitis, topical mydriatics, cycloplegics and steroids are generally employed to reduce photophobia and decrease inflammation. There have been no reported cases of teratogenic effects from topical mydriatics or cycloplegics. Topical steroids including prednisolone, dexamethasone, and fluorometholone have demonstrated teratogenicity in rats and rabbits respectively at low multiples of human doses. Cleft palate and other bond deformities were observed. There have been no adequate control studies in pregnant women.

As with any indication, if the potential risk of visual loss outweighs the potential risk to the fetus for any topical ophthalmic medication, its use should be considered with caution and informed consent. Punctal occlusion at the time of drop administration is advised and should be taught to the patient to minimize systemic absorption and presumably its side effects.

Figure 5. Photograph of fleshy-appearing metastic lesion to the iris in a patient with breast cancer.

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In-Office Temporal Artery Biopsy

R. Jeffrey Hofmann, MD

Due to the variety of presenting signs and symptoms, physicians in many different clinical specialties are regularly confronted with patients whose differential diagnosis must include temporal arteritis.

Temporal arteritis, also known as giant cell arteritis and cranial arteritis, is a systemic disease prevalent in the elderly with severe consequences including blindness, stroke and even death. The etiology is unknown but autoimmunity has been implicated as the cause of this vasculitis which primarily involves the carotid arterial system. The prevalence of temporal arteritis increases with age and is estimated to be about 3 cases per 100,000 over age 50 and approximately 55 per 100,000 in those over age 80 with a predilection for those living in the northern latitudes and for white women.[1] In some northern areas it may be as high as 843 per 100,000 for those older than 80 years.[2] Prompt diagnosis is essential because it is the only treatable vascular cause of blindness, but treatment is effective only if it is initiated before blindness has occurred. The blindness is sudden in onset, usually unilateral, and once present is rarely reversible. More importantly, if patients with unilateral blindness are not diagnosed and treated, in one-third of cases the contralateral eye will become blind within four weeks.

Signs and Symptoms

The first manifestations of temporal arteritis are the nonspecific symptoms of anorexia, weight loss, fever, myalgia, depression and malaise, and the more characteristic symptoms of temporal and occipital headache, scalp tenderness, and jaw claudication. Pauley and Hughes state, "When elderly people begin to fail mentally and physically, this disorder should be one of the first to be considered."[10] Ophthalmological and neurological signs and symptoms usually occur several weeks later but at times they may be the first manifestation of the disease (occult temporal arteritis). Visual loss is the most frequent and important evidence of ocular involvement. Initially there may be transient monocular or binocular visual loss (amaurosis fugax) often precipitated by assuming an upright position, but the most common presentation is a profound loss of vision due to anterior ischemic optic neuropathy (AION), an infarction of the anterior portion of the optic nerve caused by arteritic involvement of the ophthalmic and posterior ciliary arteries. AION also occurs in a more common nonarteritic form in which the visual loss is less profound, the age group younger (usually 40-65) and, unlike temporal arteritis, is usually associated with a normal sedimentation rate and a small and crowded optic disc. Non-arteritis AION does not respond to steroids. In temporal arteritis, visual loss may also result from posterior ischemic optic neuropathy (PION), central retinal artery occlusion and branch retinal artery occlusion. Other common ocular manifestations of the severe ocular hypoxia include ocular muscle palsies and diplopia, ocular ischemic syndromes, including hypotony and rapidly developing cataract, ocular inflammations with hyperemia of the conjunctiva and episcleral vessels, which may be mistaken for conjunctivitis, and a wide range of neurological abnormalities.

This has been found to be a safe, rapid, and cost-effective procedure which is convenient for the patient, does not necessitate hospitalization, "pre-op" testing, or operating room scheduling.

Diagnosis

The diagnosis of temporal arteritis should be considered in all patients older than 50 years of age who develop inflammatory and ischemic signs and symptoms involving the area of the carotid circulation. When the diagnosis of temporal arteritis is considered, an erythrocyte sedimentation rate (ESR) should be obtained. The normal range of sedimentation rates has not been definitely determined, particularly for the elderly, but we consider the upper limit of normal in men to be one-half the patient's age and in women to be one-half the patient's age plus ten. The median ESR in temporal arteritis is 96 with a range of 50-132. However, in a small number of cases, the ESR may be normal in patients who do have temporal arteritis,[3] so that if the clinical picture suggests temporal arteritis, temporal artery biopsy is indicated even in the face of a normal ESR. Conversely, the ESR is nonspecific and an elevated value, while suggestive, does not confirm the diagnosis of temporal arteritis. Nonarteritic causes of an elevated ESR include arthritis, collagenoses, occult infections, and neoplasms.

The following case report of a patient seen in our office demonstrates the complex picture which patients with temporal arteritis may present:

ABBREVIATIONS USED

AION: Anterior ischemic optic neuropathy
CBC: Complete blood count
ESR: Erythrocyte sedimentation rate
MRI: Magnetic resonance imaging
OD: Right eye
OS: Left eye
PION: Posterior ischemic optic neuropathy
PMR: Polymyalgia rheumatica
VDRL: Veneral Disease Research Laboratory (test for syphilis)

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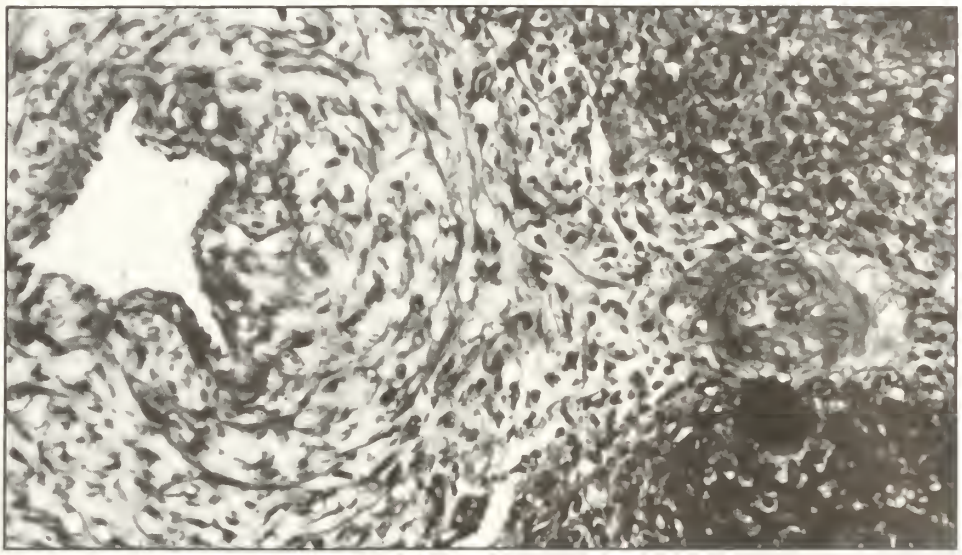

A section of the temporal artery shows marked intimal thickening and a mixed inflammatory infiltrate in the media with a multinucleated giant cell.

An 82-year-old woman presented on 5/17/95 complaining of "flickering vision" in both eyes with a large "leaf-life" floater in the left eye. She had been examined five months earlier and was noted to have cataracts in both eyes with best corrected vision of 20/50 O.D. and 20/60 O.S. Otherwise the examined at that time was not remarkable and she had no significant past medical history and did not require any medications.

On examination her vision was essentially unchanged from her previous visit. Her pupils were equal and reactive to light without an afferent defect, and she had full motility. Slit lamp examination showed bilateral anterior uveitis with multiple keratic precipitates and 2+ cell and flare. She was treated with topical prednisolone and decadron ointment. On 5/22/95 she returned for a follow-up visit and was noted to have much less cell and flare, but still complained of "flickering vision." Her topical steroids were decreased. On 5/25/95 she developed vertical diplopia and "even blurrier" vision. Best corrected vision was decreased by one line in both eyes to 20/60 O.D. and 20/70 O.S. She exhibited a 6 diopter left hypertropia which increased in right gaze consistent with a left superior oblique palsy. She still had a mild anterior uveitis with 1+ cell and flare and a few keratic precipitates in the left eye. Most importantly, both optic nerve heads had significant papilledema. An MRI scan of the head was normal. On 6/2/95 she reported that the diplopia had resolved, the "flickering" had decreased, but that her vision still seemed somewhat "blurry." Her vision was still 20/60 O.D. and 20/70 O.S. The hypertropia had resolved and her anterior uveitis was quiescent. However, she still had elevated optic nerve heads. A CBC. VDRL, rheumatoid factor and chest x-ray were all normal but the Westergren ESR was 104 mm./hr.

A repeat ESR was 102 mm./hr. Carotid flow studies revealed no flow in the left temporal artery and only a very small amount of flow in the right temporal artery.

On 6/12/95 when the elevated ESR was confirmed, I performed a temporal artery biopsy. At the time of the procedure there was so little bleeding that the electrocautery unit was not required. The specimen of artery was rigid and the entire lumen clearly obliterated. The patient was at imminent risk of blindness and was immediately started on 100 mg. of prednisone. Within 24 hours the pathologist reported "marked inflammation and multinucleated giant cells consistent with giant cell temporal arteritis" (see Figure 1).

The patient reported an immediate and dramatic return to a feeling of well-being with no further diplopia or "flickering vision." On 7/10/95 her visual acuity was the same (secondary to her cataracts), there were no anterior chamber cells or flare, and her optic nerves had returned to normal. Her ESR was 18 mm./hr. and her prednisone dose was tapered further to 40 mg./day. She is to be followed with serial ESRs and her prednisone dosage adjusted accordingly.

A confusing aspect of temporal arteritis is an apparent relationship with polymyalgia rheumatica (PMR). PMR, which also afflicts the elderly, is characterized by muscle pain and stiffness in the neck, shoulders, and hips, as well as general fatigue. Some authors consider these two conditions to be variants of the same disease[5] while others consider them separate rheumatic diseases. The ESR is elevated, the condition responds well to steroids – but in doses lower than required to adequately control temporal arteritis, and there is no pathological evidence of inflammation in the muscles. There is a high incidence of positive temporal artery biopsies in patients with PMR and some patients progress from one condition to the other. Patients with PMR should be followed carefully to recognize a transition to temporal arteritis at an early stage.

While an appropriate constellation of signs and symptoms, and an elevated ESR may strongly suggest temporal arteritis, only a positive temporal artery biopsy will confirm the diagnosis. A temporal artery biopsy provides a definitive diagnosis when positive, and, when properly performed, is falsely negative in fewer than 10% of cases.[4] The pathological findings consist of disintegration of the internal elastic membrane of the arterial wall and the presence of mononuclear or granulomatous inflammation. While multinucleated giant cells are the histopathologic hallmark of the disease, the specimen does not necessarily have to include giant cells to confirm the presence of the disease.[5] The biopsied artery may contain "skip areas" of normal appearance so the biopsy specimen must be examined at several different points to assure detection of the disease when present. If the initial biopsy is negative, but the history, physical findings and ESR are typical of temporal arteritis, a biopsy should be done on the opposite side.

In response to the clear need for a simple, expedient, and reliable way of obtaining a biopsy to confirm the presence, or absence, of temporal arteritis, I have been performing in-office temporal artery biopsies for the past six years. This has been found to be a safe, rapid and cost-effective procedure which is convenient for the patient, does not necessitate hospitalization, "pre-op" testing, or operating room scheduling. Patients experience much less anxiety, and, most importantly, the procedure can be performed without delay.

Method

The biopsy should be performed on the same side as the predominant symptoms. The key to a successful procedure is accurate identification of the course of the superficial temporal artery. This can usually be easily determined by palpation starting just in front of and above the ear. When determined, its course is marked with a surgical marking pen. The appropriate area is shaved, cleaned with Betadine, and anesthetized with local anesthetic. The skin is incised and careful dissection is carried out to identify the temporal artery which lies embedded in fibro-fatty tissue on the surface of the fascia of the temporalis muscle. Difficulties may be encountered, particularly when the artery is of very small caliber due to proximal obstruction or its branches may be confused with those of the facial nerve. Hemostasis is maintained with the Ellman Surgitron radiowave unit or similar cauterizing instrument. A specimen of at least two centimeters in length and preferably three or more should be obtained so that different segments of the artery can be examined pathologically to prevent a false negative report due to "skip areas." The artery is tied off with #4-0 silk sutures, cut carefully between the sutures, and the specimen immediately placed in formalin. The skin is sutured and covered with a small bandage and the sutures removed in 5-7 days. In summary, temporal artery biopsy is

a remarkably safe procedure. The rarely observed complications include facial paralysis or brow ptosis,[6] infection, wound dehiscence, scarring and hemorrhage resulting from an improperly placed or tied arterial suture.

Results

Sixty-nine office temporal artery biopsies have been performed over the past six years. Many of the patients presented to our office with suggestive ophthalmic complaints, including sudden loss of vision in one eye, but the majority of patients were referred by other physicians specifically for the temporal artery biopsy. Of the 69 patients, 58 were women and 11 were men. There were 10 positive biopsies (14.5%) of which 7 were women and 3 were men, an incidence which is consistent with other reports in the medical literature.[7] Four of the 10 patients with positive biopsies presented with loss of vision in one eye, but none lost vision or sustained other complications after the correct diagnosis was made and treatment initiated. There were no complications associated with the procedure, but two specimens were insufficient for diagnosis.

Treatment

High dose steroid therapy is the only effective treatment for temporal arteritis. When the diagnosis is clinically evident, treatment should be started at once without waiting for the ESR or biopsy report. Steroid therapy will not affect the validity of the biopsy as long as the procedure is performed within eight days of the onset of treatment and the steroids can be easily and quickly tapered if the biopsy report is negative. The major problem in the treatment of temporal arteritis is the use of inadequate steroid dosages to prevent progression of the disease.[8] Treatment should be started with the equivalent of 80-120 mg. of prednisone daily or intravenous methylprednisolone 250 mgm. every six hours.[9] Immediate symptomatic improvement is the rule and the ESR usually returns to normal within a week or two. It is advisable to maintain the initial treatment level for at least two weeks and then to taper no more than 10% of the dosage each week depending on the patient's symptomatology and serial ESRs.

Temporal arteritis is thought to run a self-limited course of months to years. While the steroids suppress its manifestations, they do not shorten its course or cure the disease. Most patients can be tapered off steroids in one or two years but some require more prolonged treatment and observation for as long as 5 to 10 years.

These severe complications of long term corticosteroid therapy in the elderly include uncontrolled diabetes, aseptic necrosis of bone, osteoporosis with vertebral fracture, peptic ulcer, depression, and susceptibility to infection. Patients should not be exposed to the risk of these serious complications unless the use of long term steroids is absolutely necessary to prevent loss of sight or life.

Summary

Biopsy is essential in the diagnosis of temporal arteritis. Temporal artery biopsy done in the office has many advantages. Patients tolerate the procedure well with little anxiety. There is greater convenience for the patient and ease of scheduling for the referring physician. It can be done promptly and is far more cost-effective than performing the procedure in a surgical center or hospital. Finally, and perhaps most importantly, because the in-office procedure is safe, more convenient, less stressful, and less expensive, clinicians are more likely to obtain a temporal artery biopsy when the diagnosis of temporal arteritis is even a remote possibility. Contrariwise, there is evidence to indicate that many cases of temporal arteritis are not diagnosed because of reluctance to schedule a biopsy.

The ophthalmologist is in a unique position to provide help in the diagnosis and follow-up care of the patient with suspected temporal arteritis. Ophthalmologists are familiar with the disease, its treatment, and particularly its ocular manifestations. In addition to the baseline ophthalmic examination to help reveal subclinical pathology, ophthalmologists can evaluate the patient as subsequent visual complaints arise. Finally, by offering a convenient biopsy procedure, the diagnosis can be accurately and promptly confirmed.

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Figure 1.

Recent innovations that can help overcome problems with glasses or contact lenses include progressive bifocals, soft lenses that correct a wide variety of problems, and various kinds of refractive surgery involving incisions, lasers, or both.

How light is focused in the eye.

Rays of light that penetrate the eye are focused by the cornea and crystalline lens onto the retina, which in turns converts the light into electrical impulses that are transmitted to the visual cortex. If the rays are focused clearly on the retina, a sharp image is seen, and neither glasses nor contact lenses are needed. This normal condition is called *emmetropia.*

Recent innovations that can overcome problems with glasses or contact lenses include . . . various kinds of refractive surgery involving incisions, lasers or both.

Eyes that are not emmetropic are said to have *refractive errors* (Figure 2). While they're not usually considered a disease, uncorrected refractive errors make objects at certain distances appear blurred and can make routine visual tasks impossible. Most refractive errors are readily corrected with spectacles.

Here are the major refractive errors:

• *Hyperopia.* If the rays of light are focused behind the retina, objects appear relatively clear in the distance but blurred at a closer range. This condition – "hyperopia" or "far-sightedness" – often results from an unusual shortness of the eye, but it can also occur if the cornea is too flat.

• *Myopia.* If the rays of light are focused in front of the retina, near vision is clear, but distance vision is blurred. Oftentimes myopia is caused by an elongated, somewhat egg-shaped eyeball, but it can also be due to a cornea that is too steep.

• *Astigmatism.* If the rays of light are focused in different planes depending on where the light strikes the cornea, the patient may see vertical lines (or tall objects) with a different level of clarity than horizontal objects. Astigmatism commonly occurs because the cornea is not spherical: a normal cornea is shaped like the surface of a basketball, while an astigmatic cornea looks more like the surface of a football.

• *Presbyopia.* In a young emmetropic eye, distant objects are focused clearly on the retina. However, in order for us to see close objects cleaerly, the crystalline lens must become more powerful (i.e., thicker). This "accommodation" is accomplished by contraction of the ciliary muscle (Figure 3). As we age, however, several factors, including a loss of clasticity of the lens, make accommodation more difficult, and ultimately impossible. By the age of 65, most emmetropic people have completely lost the ability to see close objects. This progressive loss of accommodation is called presbyopia (literally, "older eyes").

Non-surgical innovations

Progressive bifocals (also called "no-line" bifocals) are a recent innovation that improves the way we deal with presbyopia.

The obvious initial solution was to use reading glasses, which are mild convex lenses that further focus the light from close objects. Unfortunately, reading glasses cause light from distant objects to focus in front of the retina and therefore blur distant objects.

In 1784 Benjamin Franklin invented bifocal glasses, in which the convex reading lens is fused onto the lower half of a pair of distance glasses, allowing close viewing through the lower half of the lens. Since Franklin's time, generations of "over 40s" people have been struggling to adapt – physically and psychologically – to bifocals. The line in the bifocal – in addition to

ABBREVIATIONS USED

AK:	*Astigmatic keratotomy*
ALK:	*Automated lamellar keratoplasty*
FDA:	*Food & Drug Administration*
LASIK:	*Laser assisted in situ keratomileusis*
PRK:	*Photorefractive keratectomy*
RK:	*Radial keratotomy*
UV:	*Ultraviolet*

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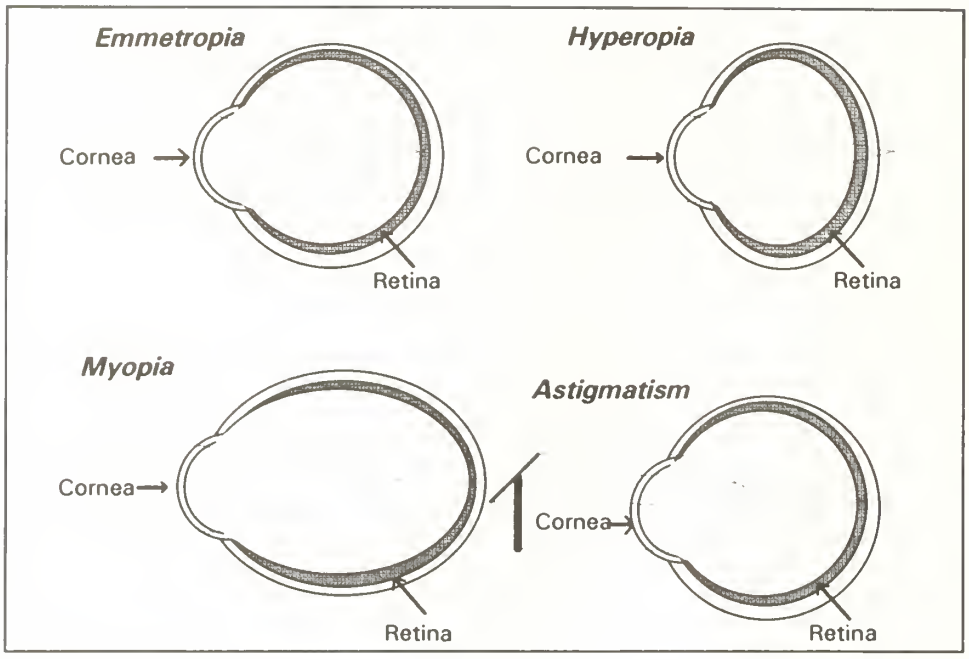

Figure 2. Refractive errors.

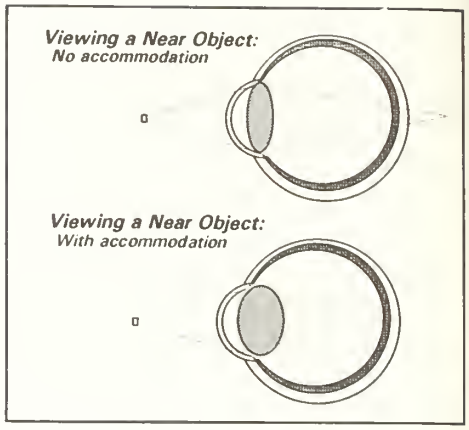

Figure 3. Accommodation.

signaling one's entry into middle age – causes the image to jump and can make walking down steps and other activities quite difficult.

Progressive bifocals are the product of modern computer design and may be a useful – and appealing – alternative. The power of the convex lens is gradually increased in the lower half of the glasses forming a shape similar to the bottom half of an hourglass. With small movements of the head and eyes, the wearer can focus on progressively nearer objects, just as in the natural accommodation process. Cosmetically, progressive bifocals look just like ordinary glasses.

Of course, even modern progressive bifocals are not without flaws: there can be a fair amount of distortion in the objects so that straight objects might appear curved or elongated, and this takes some time to get used to.

Those people who have refractive errors and who don't wish to wear glasses may benefit from the incredible technological advances in *soft contact lens design*. Progress in materials and production has made soft lenses much more comfortable, cheaper, and even disposable on a daily basis. There is a variety of color options as well – including some unusual shades such as violet – for those seeking a new image or perhaps even a disguise.

Also impressive in today's lenses is the wide range of available refractive powers (including lenses for very myopic and astigmatic patients). There are, in fact, few prescriptions that cannot be made satisfactorily as soft contact lenses.

However, for those individuals intolerant of both glasses and contact lenses, modern *refractive surgery* may be the answer.

Refractive surgery can be divided into three types: *incisional surgery, laser surgery*, and a combination of the two.

Incisional Refractive Surgery

Radial keratotomy (RK) was perfected in the Soviety Union in the early 70's and has been done in the US since 1976. Studies by the National Eye Institute in the early 80's documented that RK is safe and effective in treating mild to moderate myopia.[1]

RK attempts to correct myopia by altering the shape of the cornea. The surgeon makes 4, 6 or 8 very deep, carefully-placed, radial incisions around the center of the cornea, avoiding the center of the cornea. These incisions cause the periphery of the cornea to "weaken" and bulge slightly thus causing the center of the cornea to flatten (Figure 4). The number, depth, and length of the incisions determine the amount of flattening. A properly flattened cornea will bend the incoming light rays less, allowing them to focus on the retina instead of in front of it.

How it's done: The surgeon first determines the number and length of the cuts necessary to correct the myopia. The decision is made on the basis of nomograms, which are tables compiled from thousands of cases. The most significant parameters are the patient's age and refractive error (i.e., the power of his or her glasses). The older the patient, the more effective the procedure will be. This difference may have to do with the younger patient's more rapid healing ability, since rapid healing may allow the cornea to resume its previous contour.

The procedure is done with the patient fully awake; pain is eliminated via anesthetic eye drops. The patient lies down and fixates on a light from the operating microscope. The surgeon measures the precise thickness of the cornea with an ultrasonic instrument and sets the micrometer on a diamond blade to ensure a uniform deep cut, trying to achieve 90% of the entire thickness of the cornea. After noting the center of the patient's cornea, the surgeon makes the cuts. The procedure takes about 15 minutes.

RK is painless. Post-operative pain is typically mild. (Remember that the incisions – although they penetrate the cornea almost full-thickness – are exceedingly thin, so the corneal surface is barely disrupted.) Vision without glasses improves to an optimal level fairly rapidly (often that same day), but may fluctuate for weeks. Glare from the incision edges is noted by most patients early on.

Results of RK seem quite good. According to the best results published to date,[2] 99% of 205 patients saw 20/40 or better without glasses. (20/40 is the minimum legal driving vision in Rhode Island.) It is important to note that this level of success required 30% of the patients to undergo an *enhancement* – a euphemism for a second procedure.

Despite these good results and years of experience with RK, there are some lingering uncertainties. One recent concern has been a lack of refractive stability noted in up to 24% of patients in the original NEI study after at least five years.[3] These patients have been getting less and less myopic over the years. Many have become far-sighted as a result. In an effort to overcome this problem, current RK surgeons are making fewer and shorter incisions as well as trying to undercorrect the myopia intentionally.

A second, somewhat controversial, prob-

lem with RK is that the very deep cuts may never fully heal. RK patients may thus be more susceptible to serious injury from significant blunt trauma. Anecdotal reports on both sides of this issue are difficult to assess, but the premise seems reasonable.

Astigmatic keratotomy (AK) is a procedure to correct astigmatism. It's surgically similar to RK; however, the incisions are not radial but tranverse. One or two cuts are made (again, at 90% depth) in the part of the cornea that is too steep. If a patient is both myopic and astigmatic – a fairly common combination – RK and AK may be combined (Figure 4).

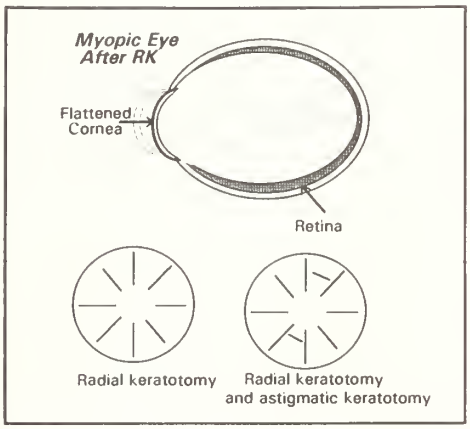

Figure 4. Radial keratotomy and astigmatic keratotomy (RK and AK)

How it's done: As in RK, the surgeon consults nomograms to decide how close to the center of the cornea he/she should place the incisions and how long they should be. The key parameters are the patient's age and amount of astigmatism to be corrected. In other respects, the procedure is like RK.

Results of AK are fairly good but seem to lack the predictability of RK.

Automated lamellar keratoplasty (ALK) is a new procedure done using an automated keratome. This mechanical device functionally resembles a cheese cutter and is used to shave off microthin slices of cornea to correct myopia (and some mild levels of hyperopia).

How it's done: With the patient under topical anesthesia, the keratome is placed on the cornea. A suction device "seals" it to the globe. The keratome is activated by a foot pedal controlled by the surgeon. The first cut slices a very thin "cap" off the cornea (Figure 5). The cap is set aside, and a second cut is made into the cornea. The precise depth of the second cut determines the amount of correction: the deeper it is, the more the myopia is corrected.

After the second cut, the keratome is removed and the cap is placed back onto the eye. Surprisingly, the cap sticks, almost like Velcro, to the underlying corneal tissue, and no suture is needed. The procedure takes 15 minutes, but is technically very demanding. The assembly and proper alignment of the keratome on the eye is also critical, and misalignments can easily lead to poor results.

Patients have very little postoperative pain because there is little surface disruption. As in RK, vision recovery is rapid by the first post-op day. With time, the cap adheres permanently, and corneal nerves regrow into it.

ALK results are fair, with a great deal of variability compared to RK. This is probably due to the extremely high level of centration and accuracy needed to make the second cut. An advantage of ALK is that it appears to work on very myopic patients, in contrast to RK and excimer laser.

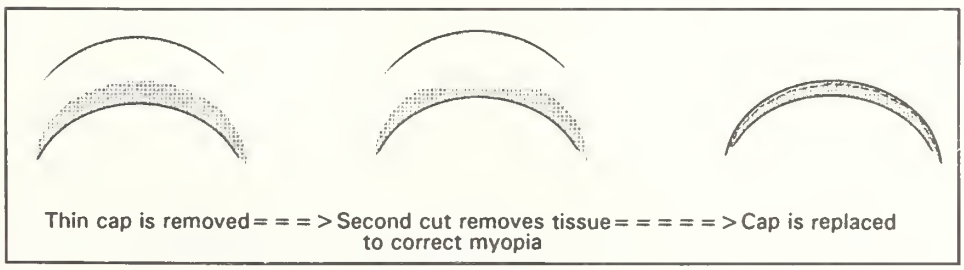

Figure 5. Automated Lamellar Keratoplasty (ALK)

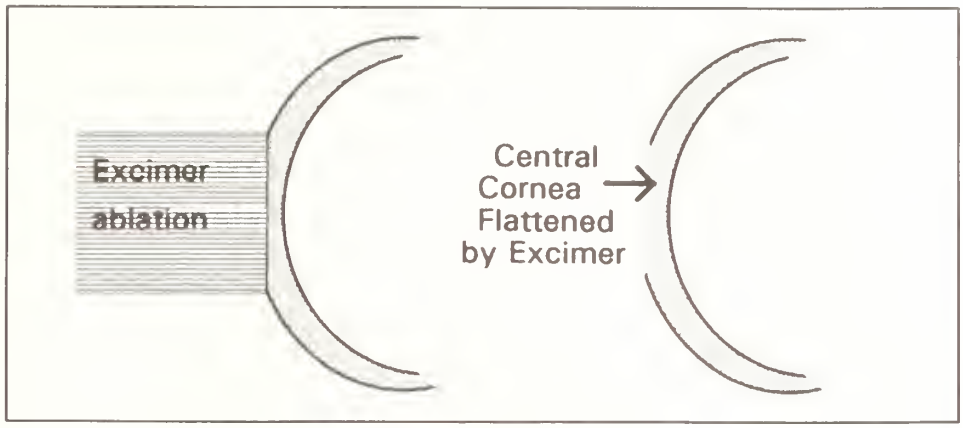

Figure 6. Excimer Laser Photorefraction Keratectomy (PRK)

Laser Refractive Surgery

Photorefractive keratectomy (PRK) using the excimer laser is an emerging technology that's exciting to the many mildly to moderately myopic patients in the US who faint dead away at the thought of a sharp blade coming at their eyes while they are awake. The patients are not the only ones ready to jump on the bandwagon: ophthalmologists, optometrists, laser companies and large venture capital companies, willing and able to invest $500,000 per unit, are all lining up awaiting FDA approval.

The excimer laser is a UV laser emitting light at 193 nm. It essentially vaporizes ("ablates" is the term often used) a very thin section of corneal substance (Figure 6). A series of concentric disk-like ablations in the center of the cornea effectively flattens the cornea in this zone. The central flattening – as in RK – makes the cornea bend the incoming light rays less and causes the rays to focus on the retina instead of in front of it.

How it's done: Prior to the procedure, the patient's data (age, refraction) are entered into the excimer laser's computer software. When the patient lies down under the laser (which is equipped with an operating microscope), anesthetic drops are instilled by the surgeon, who then removes much of the epithelium of the cornea with a surgical sponge, creating what is essential a large corneal abrasion.

Then, with the patient looking at a fixation light, the surgeon activates the laser with a foot switch. A series of ablations is done; the exact number depends on the level of myopic correction needed. The more myopic the patient is, the more ablations are needed, and the longer the procedure takes.

Typically, the total time for all the ablations is quite short (15-45 seconds). Each ablation makes a snapping sound and actually produces some light smoke from the ablated tissue. The whole procedure (including removal of corneal epithelim) make take 10 minutes.

The patient is patched afterwards. There is typically a fair amount of discomfort (from the large, iatrogenic abrasion, plus perhaps the fact that the UV excimer ablation resembles UV keratitis). It may take

several days for the surface of the cornea to heal and for the patient to be comfortable.

Visual recovery takes weeks to perhaps months, since the corneal surface must become smooth and lose the haze that it typically has after the procedure. Results are then comparable to RK but with little chance of continued progression to hyperopia.

One advantage of the laser over RK might be that the surgeon does not have to be as skilled, since the laser is automated. Also, the thickness of corneal tissue ablated is quite small (typically less than 10% of cornea thickness) in contrast to the 90% depth of RK incisions. A third advantage: the corneas of patients who have had PRK should have normal resistance to damage from serious blunt trauma.

One potential problem with PRK is that it involves the center of the cornea. If a patient has abnormal healing, a permanent central scar can result.

However, the biggest problem with the excimer laser is its price tag: at $500,000 (minimum) per unit and perhaps $60,000 for *annual* upkeep due to the difficulty supplying and maintaining the gas in the laser system, it's not easy to amortize costs. Moreover, the technology, especially outside the US, is changing almost daily, so one must also consider the potential for rapid obsolescence of equipment.

At present, two companies are vying for FDA excimer laser approval for PRK in the US. This will probably come within the year. Outside the US, PRK has been done on thousands of patients (many of them from the US) with apparently good results.

How excimer laser will fare in the US after FDA approval is anyone's guess. Will the demand be overwhelming and will there be an excimer on every block? The business aspect of medicine has never been so apparent as it is in the excimer race where one must invest in expensive high technology in anticipation of consumer demand that may never materialize.

Combined Incisional and Refractive Surgery: LASIK

LASIK (Laser-Assisted In-situ Keratomileusis) is a procedure currently in its developmental stages. It's already being touted as the best all-around procedure for myopia. LASIK (also known as "Flap and Zap") seems to combined the best elements of ELK and excimer laser.

How it's done: The procedure is begun like ALK, with the patient anesthetized topically, lying supine under the operating microscope. However, instead of completely removing the corneal cap, the surgeon leaves it hinged to the eye (that's the "flap").

At this point the automated keratome is removed, and the excimer laser is positioned over the patient's eye. Then, according to software algorithms, the excimer ablates the necessary myopic correction in the cornea (the "zap"). The cap is then flapped back into position. Like the cap in ALK, the hinged flap stays firmly in place without suturing.

As with ALK, postoperative pain is minimal, and visual restoration is rapid, since there is little disruption of the corneal surface. But unlike the second pass of the keratome in ALK, the excimer can make a much more exact tissue excision. Thus, results seem much more predictable than with ALK. Also, like ALK, LASIK seems to work on even very myopic patients.

However, although potentially very promising, LASIK unfortunately combines the technical difficulty of ALK and the high cost of excimer. Only further studies will confirm whether this will be the refractive procedure of choice in the future.

All of these high-tech solutions to refractive errors may seem too good to be true, but they are actually in use – and evolving rapidly. It's exciting for ophthalmologists to be able to offer these services to our patients.

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CHILDREN 6 to 12 years: 1/2 teaspoonful; 1 to 3 years old: 20 drops; 6 months to a year: 10 drops

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Brown's Cadmuses of the Blind

Joseph L. Dowling, Jr., MD

On a warm summer day in Boston, 1831, as was their custom, Dr. John Dix Fisher and two companions strolled leisurely down Boylston Street on their way to lunch. Suddenly pausing and pointing his finger at an approaching figure, Fisher exclaimed, "By heaven there's Howe! The very man we have been looking for." That chance meeting between Dr. Fisher and his college friend, Dr. Samuel Gridley Howe, led to a lifetime of collaboration that has transformed treatment of the blind from that day to this.

John Dix Fisher, Brown Class of 1820, a descendant of the first settlers of Dedham, Massachusetts, received the M.D. degree from Harvard Medical School in 1824. In accordance with the custom of the time, he went abroad for two years of post-graduate study. In Paris, under the tutelage of world-renowned Professor Rene Laennec, inventor of the stethoscope and the father of pulmonary medicine, Fisher became an expert in the newly devised technique of auscultation and was the first to report the presence and significance of cranial bruits. On his return to Boston, he developed a busy medical practice; wrote an esteemed textbook entitled "Description of the Distrinct Confluent and Inoculated Smallpox"; witnessed the first use of general anesthesia in the Ether Dome; and became a pioneer and authority on obstetrical anesthesia. Known for his many charitable works and moral courage, Fisher served on many committees and was a physician at the Massachusetts General Hospital. He was described as "even tempered, kindly, remarkable for the simplicity of his demeanor and ever ready to help a fellow physician." Never in robust health, he died in 1850 at the age of 53. After his death, a group of friends and patients met to consider how they could honor his many accomplishments. They decided to erect a monument bearing the inscription "To John Dix Fisher, M.D. by those who loved him for his virtues – the physician and friend of the poor," a monument that can be seen today in the Mount Auburn Cemetery in Cambridge, Massachusetts.

Howe and Fisher introduced new concepts: that the blind have the right to education, the capacity to learn and the ability to be prepared for an independent adult life and be assimilated into society.

Samuel Gridley Howe, Brown Class of 1821, a member of a distinguished Boston family (one uncle planned the fortifications on Bunker Hill, another was an "Indian" at the Boston Tea Party) also received his M.D. degree from Harvard Medical School. Rather than enter practice, his idealistic and adventurous nature led him to follow the call of Lord Byron to Greece (Byron died before he arrived) to serve in the war for Greek independence. For seven years, often under incredibly difficult circumstances, he served as army surgeon, guerilla fighter, fund raiser, diplomat, and chief medical officer of the Greek Navy. Howe became renowned for his exploits, was awarded the Cross of Malta, and was made a Chevalier of the Greek Legion of Honor. Upon his return home, he was immortalized by John Greenleaf Whittier in the poem "The Hero." A memorial monument and flagpole commemorating Howe's Greek service stands as a landmark on the upper Brown Campus.

Throughout his life, Howe maintained a diversity of interests and is considered the most significant and foresighted figure in the American history of special education. His biographer, Frank Sanborn, writes, "It is to Dr. Howe, more than any other man, that Massachusetts holds what is best in her charitable system." Horace Mann (Brown Class of 1819) wrote, "When any benevolent enterprise is undertaken in Massachusetts, his leadership or counsel is always invoked."

Howe was an advocate for the disadvantaged of society. He was the first in this country to recognize the plight of the feeble minded and to realize that they could be educated. This fact came to his attention when he taught some blind children who were found to be also mentally retarded and realized that "if so much could be done for idiots who were blind, sitll more could be done for those not blind." Virtually alone, in the face of active opposition and derision and without any remuneration over the course of 29 years, he organized and ran the first school for the feeble minded in this country, now the famous Fernald School in Waltham, Massachusetts. Whittier wrote regarding the progress of one pupil whom he had observed "the change is almost like a resurrection from death - or rather a new creation!" Howe became the recognized authority in this country on mental retardation. Parents brought their children to him for examination and advice from all parts of the United States, and he never accepted a penny in payment for these services.

He worked closely with Dorothea Dix and together they won the first battle to improve conditions for the insane in this country. He and Horace Mann pioneered the teaching of articulation to deaf mutes in the face of strenuous opposition from the "experts" in the education of the deaf. He was active in prison reform, serving as a member of the Boston Prison Discipline Society (Dr. Wayland of Brown was the president) and author of a monograph on prison reform which has recently been reprinted as a classic in the history of American penology. Howe was an early supporter of Negro rights. As early as 1833, he had urged authorities in Boston to recognize the right of colored children to equal privileges. From 1845, he was a strong force in the anti-slavery movement, writing at that time, "Slavery is the great mistake as well as the great sin of the age." He was chairman of the Vigilance Committee whose purpose was

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to oppose slavery, and particularly, to prevent rendition of runaway slvaes. He was an active "Free Soiler", a member of the "Freeman's Inquiry Commission," and a friend and supporter of John Brown. Howe and his wife were co-editors of the strong anti-slavery publication, the *Commonwealth.* During the Civil War, he was a founder and member of the Sanitary Commission (a forerunner of the American Red Cross), which coordinated medical care for troops of both the North and South. He was a long-time trustee of the Massachusetts General and McLean Hospitals, Chairman of the State Board of Charities, a member of the State Board of Education, a member of the State Legislature, a member of the Boston School Committee, (he introduced written examinations into the school system) and he was the (defeated) candidate of the Conscience Whigs for United States Congress, running on a strong anti-slavery and anti-war platform.

Howe was a man of action throughout his life. In 1830, during his service in Greece, a near fatal attack of malaria forced him to convalesce in Europe. There, he participated in the July French Revolution, which overthrew Charles X, and served as an aide to General Lafayette. Several years later, at the urging of General Lafayette, James Fenmore Cooper and Samuel F.B. Morse, he served as Chairman of the American Polish Committee which supported Poland in its revolution against Russia. He was dispatched from Paris to deliver aid to Polish troops quartered in Prussia. While returning from this mission, he was arrested and incarcerated in a German prison without a trial or formal charge, languishing for six weeks until the American Minister was able to force his release. This incident undoubtedly influenced his subsequent interest in prison reform. Many years later, he returned to Greece to distribute relief supplies and support the Cretans in their unsuccessful attempt to free Crete from Turkish domination. Later, President Grant appointed him to a three member commission to consider the annexation of the Dominican Republic, then a highly controversial issue.

In 1843, his long-time friend Henry Wordsworth Longfellow, introduced him to a young woman from a prominent New York family, Miss Julia Ward. There was an instant attraction; she soon became his wife, mother of his six children and his co-collaborator on many of the social issues of the day. Mrs. Howe became prominent in her own right as a crusader for women's rights, a poet, and the author of "The Battle Hymn of the Republic." The Howes traveled extensively and established friendships throughout the world. On one occasion, while visiting the Nightingale family in England, their daughter sought Dr. Howe's advice on possible career choices. After a long discussion, Howe inspired Miss Florence Nightingale to pursue a career in nursing. They remained lifelong friends and the Howes' second daughter, Florence, was named in her honor.

Howe died at age 75 after a long and productive life. Massachusetts declared a state of official mourning. At his funeral, following remarks by the Governor, United States Senators and other notables, Oliver Wendell Holmes concluded the ceremony by reading a poem eulogizing Dr. Howe that stated:

No labored line, no sculptor's art
Such hallowed memory needs;
His tablet is the human heart,
His record, loving deeds.

Howe was also buried in Mount Auburn Cemetery where his monument can be seen today, not far from that of his friend and colleague, John Dix Fisher.

But Howe and Fisher left a more enduring and more forceful monument than the stones in Mount Auburn - the monumental legacy of education for and humane treatment of the blind. During his sojourn in Paris, Dr. Fisher had occasion to visit the recently founded National Institution for Blind Youths, the first school for the blind in the world. Fisher immediately recognized the need for a similar facility in the United States. Returning to Boston, he rallied the support of his many friends and, after three years of effort, convinced the Massachusetts State Legislature to enact a bill establishing "The New England Asylum for the Blind for the Purpose of Education of Blind Persons," the first incorporated school for the blind in this country. At the moment of its founding, the fledgling school had no director, no teachers, no students, no building, and no books. The serendipitous meeting with Dr. Howe, whose lifetime motto was "obstacles are things to overcome" was the catalyst which solved these problems. Dr. Howe had no experience with the education of blind children but he was a man of great resourcefulness, ingenuity and social consciousness who recognized the need, the challenge and the potential of this new undertaking. He quickly accepted Dix's offer, proffered at the time of their chance meeting, to direct this new school, a position he occupied for 44 years until his death. At that time, there was not a single qualified teacher of the blind in the United Sates. With the concurrence of Dr. Fisher, Dr. Howe soon traveled to Europe to visit the principal institutions for the blind where he found, in his words, "Much to admire but also much to avoid." Upon his return (he brought two blind teachers of the blind with him) he and Fisher sought their first students. On a trip to Andover they recruited two young blind girls, sisters Abby and Sophia Carter, the first pupils whose obvious intelligence and accomplishments were much admired by visitors to the school. For lack of a building, Howe took over most of his father's large house in South Boston to serve as his first dormitory and classrooms. Solving the book problem was a greater challenge. Printing books for the blind was such an expensive and cumbersome process that there were only three books embossed for the blind available in the entire English language. Undaunted, Dr. Howe developed a modified alphabet with reduced embossing printing on thin paper that enabled books to be printed at a fraction of the previous cost. Soon, Howe had 2,000 raised-print books in English including an encyclopedia, a dictionary and an atlas, all of which he personally compiled. This Howe type, as it was known, was widely used until braille came into use at the end of the nineteenth century. To further encourage circulation and reduce costs, Howe persuaded prominent authors to subsidize the cost of publishing and distributing their books in format for the blind. Charles Dickens, for one, personally financed the printing and distribution of 250 embossed copies of "The Old Curiosity Shop", several of which can be seen today in the library of the Perkins School.

The most important and more compelling achievement of Drs. Fisher and Howe, – far more important even than founding the school and educating individual students – was changing the attitude of society toward the blind. When the Perkins School was founded, the prevailing view in Europe and the United States held the blind to be hopelessly dependent, to be treated with charity and pity, and isolated from general society. In fact, it was considered harmful to educate the blind because then they would come to realize what they were missing. Howe and Fisher introduced new concepts: that the blind have the right to education, that they have the capacity to learn and the ability to be prepared for an independent adult life, and to be assimilated into general society. Howe emphasized the attainment of marketable skills. He prepared students to "go out in the world – not to eat the bread of charity – but to earn a livelihood by honest work." He inaugurated a workshop where students could learn various trades and skills and employers could visit and observe the students and their capabilities, a process which frequently resulted in offers of employment.

Howe had been distressed by the limited capacity of the European schools for the blind; in France there was room for only one blind child in 300. As a long-time friend and collaborator with Horace Mann, the country's leader in the controversial issues of universal free education, Howe could accept no less for blind children. He determined to make schooling available for every blind child. As a first step, he opened his school every Saturday for visitors to observe the accomplishments of his students. Most, initially skeptical, left as enthusiastic supporters to spread the reputation of this remarkable institution and often to make donations which enabled the school to grow and to accept all qualified applicants.

As the reputation of the school spread, enrollment grew rapidly and larger quarters became necessary. Thomas H. Perkins, a trustee, offered to donate his substantial home and grounds to the school but only on the condition that a $50,000 endowment be raised privately. That was a very large sum of money at the time but Howe, an excellent fund raiser, took his students on the road, appearing before charitable groups, organizing Boston's first large charity ball and soliciting individual donors. The goal was soon reached, and the school had its first new home and a new name, "The Perkins School for the Blind" by which it has been known ever since. Howe did not confine his zeal to Massachusetts. He traveled throughout the United States and Canada, appearing before legislatures and other groups urging educational opportunities for blind children. At the time of his death, he was credited with being responsible for 36 schoools for the blind.

In 1837, Dr. Howe encountered perhaps the single most formidable educational challenge of all time. At the age of two, Laura Dewey Brighman of Hanover, New Hampshire and her two older sisters contracted scarlet fever. The two older sisters died. Laura managed to survive but was left totally blind, totally deaf, totally speechless and lacking the senses of taste and smell. Her only contact with the world was through her sense of touch. Dr. Howe learned of Laura's plight when she was seven years old and traveled to Hanover to enroll her in his school. Never before had an attempt been made to educate such an unfortunate child. Howe had to devise his methods as he went along. He first pasted embossed names on common objects. When Laura learned the names of these objects, he broke the words down to individual letters. After many weeks of patient repetition, Laura suddenly grasped the concept of the alphabet and the fact that it would enable her to communicate directly. From this point, she was able to use the manual alphabet and finger spelling to become proficient in a variety of subjects, including reading, writing, arithmetic, spelling and geography. Geography was learned from a three-dimensional relief globe which stands today in the lobby of the Perkins School. The oldest three-dimensional relief globe made in the United States, it is 53 inches in diameter and consists of 700 pieces of wood glued together so well that over the years no cracks have ever appeared. Laura learned to write using a grooved board for guidance, and proceeded to keep a neat, detailed daily journal and a busy correspondence with family members, friends and visitors. She learned to sew, made most of her own clothes, and fashioned lace which she was able to sell. Howe, an advocate of physical activity, taught Laura to become a proficient swimmer and horseback rider. Charles Dickens visited Laura and wrote extensively about her and Dr. Howe's effort to educate her. "This sightless, earless, voiceless child may teach you lessons you will do well to follow. Let that poor hand of hers lie gently on your hearts." Of Howe, he wrote, "There are not many persons, I hope, who after reading of Laura Bridgman, can ever hear the name of Dr. Howe with indifference." Laura Bridgman spent her life at the Perkins School where in later years she taught sewing and occupied herself doing general housework. Howe left her a small annuity in his will which allowed her to be independent until the time of her death from pneumonia at the age of 60. Many years later, Alexander Graham Bell, familiar with the remarkable story of Howe and Laura referred Helen Keller to the Perkins School, where she was educated with the methods conceived by Dr. Howe. At the memorial celebration to commemorate the 100th anniversary of Dr. Howe's birth, Helen Keller, then a sophomore at Radcliffe College, wrote, "I express the heartfelt gratitude of those who owe their education, their opportunities and their happiness to Dr. Howe who opened the eyes of the blind and gave the dumb lip language."

From its small beginning with two students in his father's house, Dr. Howe's school is today the internationally known Perkins School, now occupying a 38-acre campus in Watertown, Massachsuetts. Perkins today provides educational and training opportunities for children from birth to age 22 and rehabilitation service for persons of all ages. In 1982, the Perkins Charter was changed to allow the admission of students with multiple handicaps other than blindness; priority is still given, however, to blind students. Outreach programs include home, infant and toddler services, clinical and diagnostic facilities, community living and the Howe Press which has produced more than 180,000 Perkins' Braillers, and circulates talking and braille books to some 14,000 clients every year. The school provides advanced training for teachers of the blind and deaf, who travel to Perkins from all over the world.

What a remarkable gift these two Brown University graduates, John Dix Fisher and Samuel Gridley Howe have left to the world!

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Osler's Bedside Library Revisited

In 1906 Dr. William Osler compiled a short list of recommended texts to serve as a bedside library for medical students. He suggested that the medical student, eager for a liberal education, "Before going to sleep read for half an hour, and in the morning have a book open on your dressing table." Osler's list of ten books were:

Old and New Testament
Shakespeare
Montaigne
Plutarch's Lives
Marcus Aurelius
Epictetus
Religio Medici
Don Quixote
Emerson
Oliver Wendell Holmes (Breakfast Table Series)

In the 90 years that have passed since this brief list was offered, social values have necessarily changed, new books have been written, and certainly newer perceptions have arisen. Accordingly, *Rhode Island Medicine* sent letters to some of Rhode Island's physicians (both practicing and academic) as well as to a few non-physicians intimately concerned with medicine, requesting that they each provide the journal with a short list of great books which, in their judgment, would fulfill the needs of a bedside library for contemporary medical students. Some of the responses were quite specific; others mentioned only authors' names much as did Osler.

Stephen J. Hoye, MD
Surgeon-in-Chief Emeritus
Memorial Hospital of Rhode Island

Doctors: The Biography of Medicine by Sherwin Nuland
Surgery in America: The Colonial Era to the 20th Century by A.S. Earle
Aequanimitas with Other Addresses by William Osler
The Early Diagnosis of the Acute Abdomen by Zachary Cope
Conversations in Medicine by Allen B. Weisse
Medicine: Preserving the Passion by Manning and DeBakey
Forgive and Remember by Charles L. Bosk
Give and Take by Francis D. Moore
The Care of the Patient by Francis W. Peabody
Caring for the Patient by Herman L. Blumgart
A Miracle and a Privilege by Francis D. Moore
Love, Peace and Healing by Bernard Siegel
Equal Partners by Judy Heymann
The Keys of the Kingdom by A.J. Cronin
Seven Story Mountain by Thomas Merton

Stephen R. Smith, MD
Associate Dean of Medical Education
Brown University

The Bible
The Birds by Aristophanes
The Call of Stories by Robert Coles
Catch-22 by Joseph Heller
Frankenstein by Mary Shelley
The Grapes of Wrath by John Steinbeck
Hamlet by William Shakespeare
Long Day's Journey into Night by Eugene O'Neill
A Misplaced Charity by Mary E. W. Freeman
The Nazi Doctors by Robert F. Lifton
Rappaccini's Daughter by Nathaniel Hawthorne

Rev. David Ames
Episcopal Chaplain
Brown University and RISD

First, Do No Harm by Lisa Belkin
In Praise of What Persists edited by Stephen Berg
True North: A Memoir by Jill Kerr Conway
The Complete Book of Menopause by Carol Landau, Michele G. Cyr and Anne W. Moulton
And All Our Wonds Forgiven by Julius Lester
Immortality by Milan Kundera
The Unresolved Paradox: Studies in the Theology of Franz Bibfeldt by Martin E. Marty and Jerald C. Brauer
The Good Doctor by Susan O. Mates
The English Patient by Michael Ondaatje
Cracking the Monolith: The Struggle for the Soul of America by William W. Rankin
The Lives of a Cell by Lewis Thomas

Richard E. Land, MD
14 Cold Brook Court
Cranston, RI 02920

Uncle Vanya, The Cherry Orchard by Anton Chekhov
A Case of Need by Michael Crichton
The Magnificant Obsession by Lloyd Douglas
The Hound of the Baskervilles by Arthur Conan Doyle
Of Human Bondage by W. Somerset Maugham
Articulations by Jon Mukand
Was Mozart Poisoned? by Peter F. Ostwald
Schumann: Music and Madness by Peter F. Ostwald
House of God by Samuel Shem
Autobiography by William Carlos Williams

Newell E. Warde, PhD
Executive Director
Rhode Island Medical Society

Snorri Sturluson
William Shakespeare
The Education of the Human Race by Gotthold E. Lessing
William Wordsworth
The Life of Sir William Osler by Harvey Cushing
Homo Ludens by Johan Huizinga
Science and the Modern World by Alfred N. Whitehead
Clarence Darrow's Summations
The Hero with a Thousand Faces by Joseph Campbell
A People's History of the United States by Howard Zinn
Conflict of Visions by Thomas Sowell
The Social Transformation of American Medicine by Paul Starr

Frank Lepreau, MD
Medical Director
Stanley Street Treatment and Resources Center
Fall River, MA 02720

Old and New Testament
Shakespeare
Montaigne
Epictetus
Emerson's Essays
Louis Pasteur, Freelance of Science by Rene Dubos
Laennec, His Life and Times by Roger Kervan
Perfecting the World: The Life and Times of Thomas Hodgkin by Kass and Kass
Markings by Dag Hammarskjold
Walden by Henry D. Thoreau

Lynn C. Epstein, MD
Associate Dean of Medicine
Brown University School of Medicine

Shakespeare
Moliere
Leo Tolstoy
Oliver Wendell Holmes
Louisa May Alcott
Sir William Osler
George Bernard Shaw
Anton Chekhov
Charlotte Perkins Gilman
William Carlos Williams
Lewis Thomas
John Stone

Frank Sullivan, MD
960 Reservoir Avenue
Cranston, RI 02910

The One Year Bible (Tyndale House)
A Writer's Journal by Henry D. Thoreau
Gospel by Wilton Bernhardt
Italian Folktales by Italo Calvino
Red Badge of Courage by Stephen Crane
Emily Post's Etiquette by Elizabeth Post
The Fireman's Wife by Richard Bausch
The Things They Carried by Tim O'Brien
Boy's Life by Robert McCammon
Judah the Pious by Francine Prose
The Sketches and Tales of Mark Twain

Hugo Taussig, MD
Elmgrove Avenue
Providence, RI 02906

King Lear, Macbeth, Hamlet, Othello by William Shakespeare
The Theban Plays by Sophocles
The Idiot by Feodor Dosteievsky
Letter to His Father by Franz Kafka
A High Wind in Jamaica by Richard Hughes
Lord of the Flies by William Golding
Alice in Wonderland by Lewis Carroll
A Portrait of the Artist as a Young Man by James Joyce
Peanuts; Calvin and Hobbes; Dennis the Menace. Selected Works

Robert V. Lewis, MD
441 Angell Street
Providence, RI 02906

Immortal Poems of the English Language edited by Oscar Williams
Science, the weekly publication of the AAAS
Scientific American, monthly publication
Times Literary Supplement of the London Times
New York Review of Books
Sky and Telescope, monthly publication
The New Yorker, weekly publication
In Praise of Folly by Erasmus
Essays by Victor Pritchard
Double Helix by James Wwatson
The Story of San Michele by Axel Munthe

Robert W. Hopkins, MD
The Miriam Hospital

Aequanimitas with Other Addresses by William Osler
The Lives of a Cell, Late Night Thoughts on Listening to Mahler's Ninth by Lewis Thomas
Mont-St. Michel and Chartres, Education of Henry Adams by Henry Adams
The Oxford Book of Greek Verse in Translation
Discoveries and Opinions of Galileo by Galileo Galilei
Short Stories by O. Henry
The Doctor Stories by William Carlos Williams
The Healing Hand, Man and Wound in the Ancient World by Guido Majno
Give and Take by Francis D. Moore

Donald J. Marsh, MD
Dean of Medicine & Biological Sciences
Brown University

(Fiction)
The Stranger by Albert Camus
The Heart of Darkness by Joseph Conrad
JR by William Gaddis
The Tin Drum by Gunther Grass
Catch 22 by Joseph Heller
The Odyssey by Homer
The Portrait of the Artist as a Young Man by James Joyce
The Trial by Franz Kafka
One Hundred Years of Solitude by Gabriel Garcia Marquez
The Red and the Black by Stendahl
(Non-fiction)
Trout by Ray Bergman
QED (Quantum Electrodynamics) by Richard Feynman
The Interpretation of Dreams by Sigmund Freud
The Best and the Brightest by David Halberstam
That's the Way I See It by David Hockney
Cities and the Wealth of Nations by Jane Jacobs
Battle Cry of Freedom: The Civil War Era by James McPherson
Letters on Cezanne by Rainer Maria Rilke
The Rise and Fall of the Third Reich by William Shirer
Language and Silence by George Steiner
The Guns of August by Barbara Tuchman
The Double Helix by James Watson
The First Three Minutes by Steven Weinberg

Irving A. Beck, MD
27 Arthur Avenue
East Providence, RI 02914

Dr. Beck, one of Rhode Island's senior internists and a former president of the American Osler Society, was asked back in 1984 to provide a list of his ten favorite books. Dr. Beck prefaced his selections with the following comments:

A consideration of bedside reading material should be preceded by determining the objective of such reading. Osler regarded it as a method, low-cost in time and money, of acquiring a liberal education. Bedtime reading is common and convenient. The selection varies with the reader's taste and purpose, whether purely recreational or educational. As put by Anatole Broyard, "It's a question of what sort of vision of the world and of yourself you want to close your eyes on. You can either interpose a diversion between your day and your sleep, or you can elect to continue the struggle." Osler did also allow for a matinee (in its original meaning) by having the book "open in the morning." One has to have an off-beat circadian rhythm to indulge in recreational reading at that time. However, as your inquiry included personal habits, I have often since student days been an early morning reader. Among other reasons it was the time, particularly when in active practice, when I was least likely to be disturbed.

I do believe, however, that the time and place of reading is irrelevant. What is important is that there be a balance between reading purely for pleasure and reading for increasing one's knowledge of any subject. Whatever the proportions or subject, it should be directed towards helping physicians (mature or embryonic) become well-rounded educated persons. One hears widely that modern physicians are so skewed by their college and medical school curricula towards the sciences that they are comparatively ignorant of what are termed the humanities. Some critics, misusing the etymology, regard this as contributing to an alleged lack of humaneness in dealing with patients. That a physician's education should be liberal, and include study of disciplines other than his own, is by no means new. Elisha Bartlett (the man identified by Osler as Brown's most distinguished medical alumnus and the subject of his essay, "A Rhode Island Philosopher") advocated this course in his journal for medical students in 1833.

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THE RHODE ISLAND MEDICAL JOURNAL HERITAGE

Ninety Years Ago (December, 1905)

John P. Cooney, MD of Providence offers a paper on eye strain and the general practitioner. He declares: "There is hardly a physician who does not know that eye strain may be the cause of frontal headache. There are few physicians ignorant of the fact that local neuralgias may be due to a refractive effort. Most practitioners know that an astigmatic eye may be the reason for the more remote systemic symptoms of nausea, vomiting, drowsiness, and vertigo." He refers, too, to more serious and lasting conditions, such as uric acid storms, which disappear when a refractive error is corrected. He further contends: "I do not believe that the vomiting of pregnancy can be relieved by the wearing of eyeglasses or that the cutting of a muscle will dispel the night sweats of phthisis, but I do believe that many distressing symptoms would be put to flight if it were generally understood that the overworked ciliary muscle will demand a penalty in untoward results."

Albert H. Miller, MD describes in narrative fashion an epidemic of diphtheria – its detection, confirmation, descriptive epidemiology and treatment – in an institution for children. In December of 1904, two children housed in the Providence Shelter for Colored Children took sick. Suspicious-looking false membranes of the pharynx were observed in both and cultures grew out of the Klebs-Loffler bacillus. The remaining children were carefully observed and throat cultures were periodically obtained. Ultimately, 11 children developed diphtheria, all recovering although numerous complications were recorded including nephritis, otitis, pneumonia – and two children developed recurrence of previously quiescent malaria. Therapy consisted of liquid diet, antitoxin, brandy every two hours [as a cardiac stimulant] and alcohol sponges for fever over 103.

Charles V. Chapin, MD, Superintendent of Health, presents a summary of infectious disease for the months of August and September, 1905. He notes the lowest death rate since records were begun, with a particular drop in deaths due to diarrheal disease. During these two months, there was one death from scarlet fever, six deaths from diphtheria, 12 from typhoid fever, and two from meningitis.

Fifty Years Ago (December, 1945)

The diagnosis and primary surgical treatment of hand injuries is discussed by William E. Browne, MD. The gravity of the situation is stressed by the author, pointing out that 70% of all industrial accidents involve the hand and that such injuries, if not managed properly, may permanently cripple an employee. The author first analyzes the diagnostic features of hand injury, particularly the vulnerable thumb, and offers advice in the use of X-ray facilities. He then considers nerve injury and blood vessel damage. Finally, he outlines rational principles of surgical therapy.

Peter F. Harrington, MD provides a case report of an 18-year-old female with tuberculous pneumonia to illustrate that infections may be modulated appreciably by hormonal factors. He cites older experiments which show that hypophysectomized rats do more poorly when infected with the tubercle bacillus. The specific patient reported upon was treated with adrenal cortical hormone and then showed radiologic and clinical evidence of healing. The author states that this experience warrants further studies on endrocine effects upon the course of tuberculosis.

Penicillin therapy in early syphilis is summarized by Dr. William J. Bell, MD. He reports on 108 patients so treated at the Chapin Hospital with no serious reactions. Most of these cases became serologically negative.

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The lead editorial observes that Rhode Island leads all other states in the percent of wage earners engaged in manufacturing. The many problems of industrial medicine loom in this state, not the least of which is the inadequate number of physicians trained in this discipline. The editorial further discussed why the problem has not been, as yet, fully addressed.

Twenty-Five Years Ago (December, 1970)

Thomas E. Bryant, MD, of the Office of Economic Opportunity, discusses the delivery of medical care to the poor in the seventies. He provides the following core data: "There are 22 to 25 million poor Americans. A poor American is described as one of a family of four earning $3,600 or less per year. Of the total poverty population in this country, 67.9% are white. Some 3/5ths of the poor live in the cities, but of all farm families, 40% are poor. Families headed by women are more often poor." He states further: "Poor people tend to be sick, to have sick children, to experience more retardation and chronic disability than the rest of the population, to have overly large families, and to be poorly informed about the means of achieving basic minimum health."

Gerald D. Dorman, MD, immediate past president of the American Medical Association, discussed organized medicine and the delivery of medical care in the current decade. He concludes: "The needs are great and we can't afford to do what we have done in the past - only taking care of our own patients. We must look at our entire problem. We cannot afford merely to pass resolutions." He quotes Horace Mann: "You never heard of the Resolutions of the Apostles; you hear only of the Acts of the Apostles." "The medical profession must take definite action to meet the problems that we are facing during the next decade."

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